

# NASA News

National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

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**For Release:**

July 2, 1986  
1:30 p.m. EDT

Sarah G. Keegan  
Headquarters, Washington, DC  
(Phone: 202/453-8536)

Hugh W. Harris  
Kennedy Space Center, Fla.  
(Phone: 305/867-2468)

RELEASE NO: 86-85

## DELTA 178 ACCIDENT BOARD FINDINGS

Mechanical damage to wiring caused by vibration during flight was the most probable cause of the Delta 178 rocket accident on May 3, 1986, according to Board Chairman Lawrence J. Ross, Director of Space Flight Systems at NASA's Lewis Research Center, Cleveland.

Affirming its belief that the basic design of the Delta rocket is reliable, the board investigating the loss of the Delta today reported its findings to Rear Admiral Richard H. Truly, NASA Associate Administrator for Space Flight.

The Delta rocket, which had a string of 43 successful flights since its previous failure in 1977, was lost May 3 when its main engine and vernier engines shutdown prematurely. Lack of control from the engines led to the breakup of the vehicle in the atmosphere and loss of a GOES weather satellite. Shutdown of the engines was caused by an electrical short, reducing voltage to solenoids which controlled engine propellant valves. This caused the valves to close, cutting off fuel and oxidizer to the main engine and vernier engines.

The board noted that a design change was made in Delta wiring harnesses several years ago in which previously used Polyvinylchloride (PVC) insulated wiring was replaced with Teflon insulated wiring. Unlike the PVC insulated wiring which was overwrapped for greater abrasion protection, the Teflon wire bundles were overwrapped in only a very limited number of locations. The finding was that adequate consideration in making the changes was not given to the abrasion resistance of mechanical damping afforded the new wire harnesses. Ross' board recommended redesign of the center section and engine section

wiring harnesses to rectify known deficiencies before the next flight.

The board recommendations also included a review of the booster electrical control system for determination of single failure points and possible design changes to provide redundancy as appropriate before the next launch; verification of the quality of all connectors on the next vehicles; and a call for the program to reemphasize that extraordinary care, attention to detail and personal dedication to excellence are vital to the success of systems having the limited fault tolerance of Delta.

The board also made a number of observations of items not felt to be directly connected with the accident which are potential problem areas and recommendations as to what actions might be taken. The observations ranged from high-humidity conditions for vehicles stored at KSC for long periods to instrumentation limitations and the lack of protection of the Rocketdyne engine relay box from contamination. Early suspicions that the relay box had caused the engine shutdown were ruled out through extensive malfunction testing after the box and other electrical components were recovered from the ocean.

On receiving the board's report, Truly noted the following excerpt from the board's letter of transmittal:

"In spite of the failure, it should be noted that the Delta remains a remarkably reliable element of our National Space Transportation System. Considering the nonredundant, relatively unforgiving design characteristics of expendable launch vehicles this is indeed a tribute to its highly dedicated government/industry team."

The report will be studied by Truly's office at NASA Headquarters before it is accepted and published in its final form.

- end -

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# NASA News

National Aeronautics and  
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James Kukowski  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

For Release:

July 3, 1986

Frank Bristow  
Jet Propulsion Laboratory, Pasadena, Calif.  
(Phone: 818/354-5011)

RELEASE: 86-86

## NASA ISSUES TOPEX/POSEIDON MISSION PROPOSAL REQUEST

NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., has issued a request for proposal to three aerospace firms for the purpose of selecting a single satellite contractor for the proposed U.S.-French Topex/Poseidon oceanographic mission.

From Earth orbit, the satellite would map the circulation of the world's oceans using a precise radar altimeter to measure height variations on the sea surface. These variations in the ocean topography can reveal details of currents, eddies and other features of ocean circulation. Such information is crucial to developing a global model for ocean circulation, leading to a better understanding of the role of the oceans in climate change.

The firms are Fairchild Industries, Germantown, Md.; RCA Astro-Electronics, Princeton, N.J. and Rockwell International, Downey, Calif. Each has previously conducted Phase B definition studies of the satellite required to accomplish the proposed mission.

If the mission receives congressional approval for the fiscal year 1987 budget, NASA plans to proceed with design and development of the satellite, following the planned selection of the satellite contractor in December 1986 and award of a contract in May, 1987. This schedule would permit a launch in late 1991.

Current plans call for NASA and the French Space Agency, the Centre National d'Etudes Spatiales (CNES), to collaborate on Topex/Poseidon to more fully exploit the scientific value of the data. The satellite would be designed for launch by a European Ariane-4 launcher and be capable of being retrieved by an U.S. Space Shuttle if necessary. The payload consists of two French and five U.S. sensors.

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The proposed 3-to-5-year Topex/Poseidon mission will play a key role in planned international efforts to study the Earth from a global perspective, as summarized in the recently released report of NASA's Earth System Sciences Committee.

JPL is planning the U.S. portion of the mission for the Earth Science and Applications Division of NASA's Office of Space Science and Applications. The French portion of the mission is being planned at CNES's Centre Spatiale de Toulouse in Toulouse, France.

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# NASA News

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Washington, D.C. 20546  
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David W. Garrett  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

**For Release:**  
July 8, 1986  
11:00 a.m. EDT

RELEASE: 86-87

## NEW SAFETY OFFICE AND POSITION ESTABLISHED

NASA Administrator Dr. James C. Fletcher announced today the establishment of a new Office of Safety, Reliability and Quality Assurance (SR&QA) at NASA Headquarters, Washington, D.C.

Also announced was the appointment of George A. Rodney to head the office as Associate Administrator for SR&QA. Rodney is presently Director of Mission Success at the Martin-Marietta Orlando Aerospace Co., Orlando, Fla. He is expected to join NASA about Aug. 1 and will report directly to the Administrator.

In announcing the new office and position, Dr. Fletcher said that establishment of the office is in response to the Presidential Commission on the Space Shuttle Challenger Accident which recommended that NASA establish a SR&QA office with direct authority throughout the agency. He also emphasized that objectives of the office are to ensure a NASA SR&QA program that monitors equipment status, design validation problem analysis and system acceptability in agency-wide plans and programs.

The responsibilities of the Associate Administrator will include the oversight of safety, reliability and quality assurance functions related to all NASA activities and programs. In addition, he will be responsible for the direction of reporting and documentation of problems, problem resolution and trends associated with safety. Specific activities are to:

- Ensure that SR&QA policies, plans, procedures and standards are established, documented, maintained, communicated and implemented.

- Review safety practices and standards and their application to specific programs and projects.

--Direct the thorough, prompt and accurate investigation, reporting and analysis of all NASA mishaps, incidents and accidents and to ensure resolution of all investigation-related recommendations.

-- Ensure that a fully documented trend analysis program is conducted that includes accurate reporting of anomalies.

-- Ensure that SR&QA issues are fully considered during design reviews, flight readiness reviews, test readiness reviews, operational readiness reviews or equivalent formal reviews which are conducted prior to start up of operations for ground facilities, manned and unmanned launch operations, aircraft flight programs and acceptance testing of experimental facilities and hardware having significant risk to persons or property.

-- Ensure that field installation SR&QA organizations are staffed with sufficient and qualified professional personnel to ensure accomplishment of assigned tasks.

Rodney has extensive experience as an experimental test pilot, the management of aircraft and missile test programs and the direction of product integrity/product assurance programs for manned and unmanned space systems. Prior to his present position where he is responsible for providing an independent assessment of the operational readiness and reliability of the company's products, Rodney served in a similar capacity at NASA's Michoud Assembly Facility, La., for the Space Shuttle external tank. During the NASA Skylab program, he was the Program Manager for Mission Success and Quality Assurance at the Martin-Marietta Denver facility.

Rodney began his work with Martin in 1945 after service as an engineering officer and pilot in the Army Air Corps. His first two years at Martin included work as an aerodynamicist on several of the aircraft that he later test flew.

Born in June 1921, he holds a bachelor of science degree in mechanical engineering from the Carnegie Institute of Technology and is a graduate of the USAF Experimental Test Pilot School.

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Mark Hess  
Headquarters, Washington, D.C.  
(Phone: 202/453-1192)

**For Release:**

July 10, 1986

Billie Deason  
Johnson Space Center, Texas  
(Phone: 713/483-5111)

RELEASE NO: 86-88

## RFP ISSUED FOR TECHNICAL AND MANAGEMENT INFORMATION SYSTEM

The National Aeronautics and Space Administration has issued a request for proposal to approximately 250 firms for a Technical and Management Information System (TMIS). The TMIS will support the technical management functions of the overall Space Station Program including the design, development and operation of the Space Station.

This procurement includes design, acquisition and/or development, implementation, maintenance and operation of the TMIS which will link the various NASA centers supporting the Space Station program, intercenter transmission of technical and management information.

The TMIS will automate the generation and interchange of documents, correspondence, schedules, engineering data, engineering drawings, budget data and other management information for the Space Station program.

TMIS will be implemented in increments. One system integration contractor will be selected to implement all increments approved during the 8-year performance period. The contract also will provide for a 2-year unpriced option extension.

The first increment of the TMIS has been approved for development. This increment would be operational less than 1 year after the contract award date.

The contract is cost-plus-award-fee level of effort. Competing firms are required to submit a detailed design for the first increment, along with a total systems architecture including future increment conceptual designs. Also required is submission of a continuing level of effort for: strategic planning, increment design/implementation, maintenance and operations, and information management.

Proposals must be submitted by Oct. 10, 1986. Contract award is expected in April 1987.

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David Garrett  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

**For Release:**

July 10, 1986  
10:30 a.m. EDT

Hugh W. Harris  
Kennedy Space Center, Fla.  
(Phone: 305/867-2468)

Release No. 86-89

## KSC DIRECTOR SMITH TO RETIRE

Richard G. Smith, Director of Kennedy Space Center, Fla., today announced his retirement from NASA effective July 31. He will become President and Chief Executive Officer of General Space Corp., Pittsburgh.

Deputy Director Thomas E. Utsman will serve as Acting Director until a new Director is appointed by NASA Administrator Dr. James C. Fletcher.

Smith, who has been director of Kennedy since September 1979, has spent his entire career, spanning more than 35 years, in the space program. He joined the rocket research and development team at Redstone Arsenal in 1951 upon graduation from Auburn University. In July 1960 he transferred to NASA when the Development Operations Division of the Army Ballistic Missile Agency became the nucleus for the establishment of the George C. Marshall Space Flight Center, Huntsville, Ala.

Serving in positions of increasing responsibility at Marshall, Smith was appointed Deputy Manager and later Manager of the Saturn Rocket Program. In January 1974, Smith became Director of Science and Engineering and served in that position until he was appointed Deputy Director of Marshall later that year.

On Aug. 15, 1978, Smith accepted a 1-year assignment as Deputy Associate Administrator for Space Transportation Systems at NASA Headquarters, Washington, D.C. He served as Director of the Skylab Task Force, appointed by the NASA Administrator, to represent NASA preceding and following the reentry of Skylab.

For his contributions to the Apollo, Skylab and Space Shuttle Programs, Smith has received the NASA Medal for Exceptional Service in 1969 and the NASA Medal for Distinguished Service in 1973 and 1981. In January 1980, he received NASA's Outstanding Leadership Medal for his management of the Skylab Reentry Program.

He also was awarded the rank of Meritorious Executive in the Senior Executive Service in 1980 and Distinguished Executive in 1981. In June 1981, he was awarded an honorary doctorate of science Degree by the Florida Institute of Technology. His Alma Mater, Auburn University, awarded him an honorary doctor of science Degree on Dec. 9, 1983.

In commenting on his retirement, Fletcher said, "NASA is losing one of its strongest managers and engineers in the retirement of Dick Smith. His leadership in running major agency programs and directing the Kennedy Space Center through the advent of the Space Shuttle era will be sorely missed. He has been a force for excellence at all levels of his career, from the time he served as a beginning engineer to his present position as Director of the Kennedy Space Center and a member of NASA's Senior Management Council. Mitigating the sense of loss, is my delight that Dick's talents will continue to be utilized in the private sector to further develop the nations capabilities in space operations."

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Headquarters, Washington, D.C.  
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**For Release:**

July 14, 1986

H. Keith Henry  
Langley Research Center, Hampton, Va.  
(Phone: 804/865-2934)

Release: 86-90

## NASA FEATURES AERO-SPACE PLANE, RESEARCH PILOTS AT EAA CONVENTION

NASA returns to Oshkosh, Wisconsin, Aug. 1-8, with a new exhibit, entitled "21st Century Aviation", for display at the 34th Annual EAA International Fly-In Convention and Sport Aviation Exhibition.

Visitors to the NASA exhibit will gain a glimpse of the future, including potential concepts of the joint NASA/Department of Defense National Aero-Space Plane Program, announced by President Reagan in his 1986 State of the Union address.

As envisioned, future hypersonic cruise vehicles would be capable of flying intercontinental ranges at high altitudes and speeds within the atmosphere. For example, a hypersonic vehicle could reduce trip time from the U.S. West Coast to Tokyo to about 2 hours. The comparable subsonic flight takes more than 10 hours. A second major application would provide aero-space vehicles efficient and powerful enough to boost payloads and passengers to Earth orbit.

Throughout the 6,000-square-foot exhibit, research tools and techniques needed for aircraft of the 21st Century are explored. Highlighted are rapidly increasing computer capabilities:

- o NASA's Ames Research Center, Mountain View, Calif., has a new supercomputer and simulation complex soon to be capable of one billion computations per second. Complex measurements of air flow around modern and advanced aircraft that once took days or weeks will now take only minutes. The aerospace industry and universities also will use this national resource.

o Advanced cockpit displays may be touch-sensitive; aircraft controls may react to voice commands. The promise of completely redesigned cockpits is generating increased interest in human factors research -- how these and other projected technologies will affect pilot satisfaction and performance.

Other displays include a close look at rotorcraft research and potential applications. In addition, a variety of live and taped features will be presented daily in the Aerospace Theater. Outside the exhibit building will be the NASA AEROVAN travelling exhibit.

NASA's aeronautical research will be depicted in the agency's first exhibit of aeronautical art. Thirteen original works have been created by some of America's foremost artists.

NASA's Goddard Space Flight Center, Greenbelt, Md., will provide its SARSAT mobile exhibit that presents an overview of the Search and Rescue Satellite system.

SARSAT is part of a multilateral cooperative program sponsored by the United States, Canada, France and the Soviet Union. The program's goal is to demonstrate the effectiveness of satellites in reducing the time needed to rescue air and maritime distress victims and significantly increase the possibility of saving lives. As of May 15, 1986, the number of lives saved had reached 576 -- 244 marine, 311 air and 21 terrestrial.

Four NASA research pilots will appear in a special evening program and speak at forum talks. The pilots fly a mixture of missions in a variety of aircraft, ranging from atmospheric research over spewing volcanoes to new concepts of flight control for military fighters.

Teacher-In-Space finalists, two of 10 chosen from approximately 11,000 applicants, will be sharing their experiences with young people and adults in several appearances during the EAA convention.

More than two dozen NASA speakers will conduct technical forums throughout the convention, ranging from "Stall-Spin Research with Radio-Control Models" to "X-Wing: Developing Technology for a Supersonic Helicopter."

NASA aeronautics centers supporting the exhibit are Langley Research Center, Hampton, Va.; Lewis Research Center, Cleveland; and Ames Research Center, which includes Dryden Flight Research Facility, Edwards Air Force Base, Calif.

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Sarah Keegan  
Headquarters, Washington, D.C.  
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**For Release:**

July 18, 1986

RELEASE NO: 86-94

## NASA TO ASSESS SRM IMPROVEMENTS AND SECOND SUPPLY SOURCE

Rear Admiral Richard H. Truly, NASA Associate Administrator for Space Flight, announced today that the agency is interested in considering an improved solid rocket motor (SRM) and directed the National Space Transportation System program manager to study options for improvement.

SRM manufacturers will be invited to provide their concepts for SRM asbestos-free insulation and other changes, such as an alternate case and propellant design, and modified burn rate for improved performance. The changes would not affect the outside geometry or interfaces with other Space Shuttle elements. The studies could lead to a second source of the SRM and/or a new (Block II) SRM.

Today's direction also states that "potential SRM contractors will be briefed (and their ideas solicited) regarding joint redesign and comments regarding the current joint baseline configuration." Plans call for the award of study contracts with interim contractor reports on SRM joint design ideas, followed by final study reports on Block II SRM designs by Dec. 31, 1986. After analyses of the Block II studies, a decision will be made on a future course of action.

This action is in lieu of the agency's December 1985 SRM second-source initiative as stated in NASA's Dec. 26, 1985, press release.

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Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

For Release:  
July 22, 1986

Jim Ball  
Kennedy Space Center, Fla.  
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RELEASE: 86-95

## TESTING OF SHUTTLE ORBITER WEATHER PROTECTION STRUCTURE SCHEDULED

Space Shuttle Atlantis is scheduled to be moved to Launch Pad 39-B to support verification testing of newly installed weather protection structures at Kennedy Space Center, Fla.

Currently stacked on Mobile Launcher Platform 1 in the Vehicle Assembly Building, Atlantis is slated to be transported no earlier than August 19.

A considerable portion of the orbiter is shielded by the Rotating Service Structure (RSS) that closes in around the Space Shuttle at the launch pad.

The new \$3.3 million system of sliding and folding doors and seals will cover previously exposed, lower portions of the orbiter to greatly reduce the risk of damage to the orbiter's fragile heat protection tiles. The metal doors will slide between the orbiter's belly and its external tank.

Other weather protection structures to provide a roof seal and enclose the space between the RSS and the external tank were checked earlier this year.

Without the shielding, the tiles are susceptible to damage from hail and wind-blown debris and heavy rains can erode tile water-proofing.

The assembled Shuttle will allow checks of structural clearances, verification of seal integrity and validation of deployment procedures and timelines.

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Operations managers and facility engineers scheduled the Pad B weather protection checkout to take advantage of having a fully assembled shuttle available. Atlantis originally had been assembled to support planned testing of Shuttle/Centaur hardware at Pad A this summer.

Existing weather protection systems at Pad 39-A are slated to be upgraded to the Pad B configuration next year.

Atlantis is expected to remain on the launch pad until early September.

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Jim Kukowski  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

**For Release:**

July 23, 1986

Joyce Milliner  
Wallops Flight Facility, Wallops Island, Va.  
(Phone: 804/824-3411, Ext. 579)

RELEASE: 86-96

## NEW BALLOON MATERIAL SUCCESSFULLY TESTED IN HIGH ALTITUDE FLIGHTS

A flight test series of high altitude balloons, launched recently from the National Scientific Balloon Facility (NSBF), Palestine, Texas, have utilized a newly developed material that is proving to be a most promising alternative to balloon film used for many years.

Acquisition of the new material and improved manufacturing processes followed a series of balloon failures occurring over the past 3 years. The failures were investigated by a Balloon Program Special Study Team and other groups appointed by the Goddard/Wallops Flight Facility, Wallops Island, Va.

The new balloon material, designated Astrofilm-E and developed by Raven Industries, Sioux Falls, S.D., has been used in two recently successful flights. One carried a 3000-pound payload to an altitude of 130,000 feet, while the other carried a 4300-pound payload to 120,000 feet. These flights were the fifth and sixth successful launches of heavy-lift balloons in seven attempts since the start of the recovery program. Five flights carried scientific instrument packages. One of four flights in this effort, using existing film, was unsuccessful.

Winzen International, Inc., Sulphur Springs, Texas, producer of Stratofilm balloon material used for the past 20 years, also is studying a new material as part of the effort to improve balloon reliability. Two Winzen-made balloons employing film provided by the Centre National d'Etudes Spatiales, the French space agency, recently were flown successfully with a 4800-pound payload.



The NASA balloon program provides support for approximately 50 flights per year for studies primarily in high energy astrophysics, astronomy and upper atmospheric research.

Scientific payloads ranging from 100 to 6000 pounds are carried aloft to altitudes between 15 to 30 miles. The balloons vary in volume from less than 1 million cubic feet to 50 million cubic feet and can provide flight durations as long as 2 days, although 12 hours is typical. The balloon material is 0.0008 inch thick. Large balloons can measure over 400 feet in diameter.

The balloon is a unique flight tool providing an in-situ platform between aircraft and satellite flight altitudes. This makes balloons particularly attractive for atmospheric research. Because of its weight-carrying capacity and flight duration, the balloon is an important element in infrared astronomy research and in cosmic and gamma ray investigations.

Most United States balloon flights originate at the Palestine site, but alternate sites for NSBF launches have included Ainsworth, Neb.; Greenville, S.C.; Malden, Mo.; Kuaii, Haw. and international sites in Canada, Australia, Italy and Brazil.

The balloon program is managed by the Goddard/Wallops Flight Facility for the Office of Space Science and Applications, NASA Headquarters, Washington, D.C.

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Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

**For Release:**

July 23, 1986  
12:00 p.m. EDT

Ed Medal  
Marshall Space Flight Center, Huntsville, Ala.  
(Phone: 205/544-0034)

RELEASE NO: 86-97

## NASA PLANS MAIN ENGINE TEST THIS WEEK

NASA today announced that another test of a Space Shuttle main engine is planned for later this week at NASA's National Space Technology Laboratories (NSTL) in Mississippi. Details of the test are still being finalized and no firm date has been set.

Last week, on July 16, a 250-second test was conducted successfully at the Mississippi test site. That test was the first in a series to verify a modification designed to extend the operational service life of turbine blades on the engine's high pressure oxidizer turbopump. The modification consists of a two-piece damper system designed to reduce significantly blade vibration and to increase blade life.

This week's test will use the same engine, 2106, and will be a follow-up to collect additional verification data.

The Marshall Space Flight Center, Huntsville, Ala., manages the Shuttle main engine program for NASA. The engine tests are conducted by Rockwell International's Rocketdyne Division, NASA's prime contractor for the engines.

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Mark Hess  
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July 24, 1986

RELEASE: 86-98

## SPACE STATION WILL INCREASE JSC MANPOWER LEVEL

Dr. James C. Fletcher, NASA Administrator, released the following statement today following a meeting with members of Congress concerning Space Station manpower levels at the Johnson Space Center in Houston:

o Current projections indicate that the total on or near-site employment at the Johnson Space Center will increase from the current level of about 12,600 to an average of 14,000 during Space Station development. These figures take into account changes made in program management. This projected employment level could increase by another 1,000 personnel through potential assignment of additional Space Station tasks to JSC. "Another way to look at this is that without the Space Station program, JSC's employment level likely will not grow significantly over the next few years."

These figures come from a joint analysis by NASA Headquarters and JSC on the impact on manpower levels of recent decisions about Space Station management. As a result of these decisions, management of the Space Station program will be shifted from JSC to NASA Headquarters and responsibility for developing systems for the habitation module and airlock shifted from JSC to the Marshall Space Flight Center in Huntsville, Ala.

o Andrew Stofan, the Associate Administrator for the Space Station, has been instructed to review the June 30 work package decisions to determine how they can be properly implemented and to develop recommendations concerning remaining decisions relative to the JSC work package role. These decisions address JSC's larger integration role and the manner in which it is to be implemented.

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"I also have instructed Mr. Stofan to incorporate in his review the formal assumption that JSC shall retain its long-term role as NASA's pre-eminent center of excellence for the development of manned spacecraft systems and have reiterated my view that the JSC role in crew and crew-related activities, trainers and simulators is not to be diminished as a result of the restructuring of work package roles between JSC and MSFC.

o The decision to shift responsibility for the Space Station's habitation module systems from the Johnson Space Center to the Marshall Space Flight Center has raised concern at JSC and in the Houston area about possible loss of identification as the focal point of NASA's manned space flight activities.

"I understand this concern. Houston has proudly emphasized its role with humans in space for many years.

"In this regard I want to assure my NASA colleagues at the Johnson Space Center and the citizens of Houston that this identification will not be lost. Houston is and will be mission control for Space Shuttle flights. Houston is and will be the training center for and the home of the corps of astronauts. It is and will continue to be the center for planning and directing Space Shuttle missions.

"Concerning the Space Station, the responsibility to outfit the habitation module was shifted to the center that is developing the module structure, or shell, because such a move will increase efficiency and simplify management communication, coordination and decision-making. JSC will have technical direction over development of habitation related systems as is appropriate for the center which is pre-eminent for manned space flight.

"Does this mean that JSC will lose its role in manned flight in the Space Station era? Absolutely not. The Johnson Space Center is the focal point of expertise in human activity in space. Much of the actual work related to the development of habitation module systems will be done at the Johnson Space Center. Astronauts who man the Space Station will be trained there. The missions to assemble and support the Space Station will be planned and controlled from Houston.

"In short, the Johnson Space Center's role as NASA's pre-eminent center of excellence in manned spacecraft systems is not changing. In the Space Station era it will be enhanced. We anticipate that any benefits to the economy of the Houston region that proceed with this association with manned flight will continue and will, indeed, be enhanced in the future."

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For Release:  
July 25, 1986

David W. Thomas  
Goddard Space Flight Center, Greenbelt, Md.  
(Phone: 301/286-8956)

RELEASE: 86-99

## NASA TECHNOLOGY STUDIED FOR USE AGAINST MENTAL DISORDER.

NASA technology is being studied for use in controlling hydrocephalus, an impairment characterized by an accumulation of fluids in the brain and accompanying enlargement of the head which can lead to mental disorders.

NASA's Goddard Space Flight Center, Greenbelt, Md., has awarded a \$696,000 contract to Case Western Reserve University, Cleveland, to perform an engineering feasibility study leading to development of a medical device to improve control of hydrocephalus. Hydrocephalus is caused by excess fluid in the brain and spinal column which increases pressure on the brain and can lead to mental retardation.

Case Western Reserve University has teamed with Johns Hopkins University's Applied Physics Laboratory, Laurel, Md.; Cordis Corporation, Miami, Fla., and Barrow Neurological Institute, Phoenix, Ariz., to perform the feasibility study.

According to Don Friedman of Goddard's Commercial Programs Office, the device could be ready for application by 1990. The device would keep cerebrospinal fluid compartments at normal capacity by use of a microprocessor-controlled cerebrospinal fluid outflow regulating system which employs the aerospace technology. Friedman said NASA's expertise in microelectronics and other miniaturized instruments is directly applicable to the design of this system, called a Cerebrospinal Fluid (CSF) Control System.

Friedman said NASA technology has been used in other miniaturized medical devices. One example is the Programmable Implantable Medication System which dispenses medication within the body, on command.

Hydrocephalus is not a disease in itself but results from serious impairment of normal circulation or reabsorption of the cerebrospinal fluid. The disorder can result from birth defects, infection or injury to the brain.

Current treatment primarily consists of surgical insertion of a shunt to divert fluid from the brain to other parts of the body. While this treatment has helped many people, problems still exist and improved systems are needed. Medical reports indicate that about 50 percent of hydrocephalus patients require repeat surgery to replace or repair the implanted shunt.

The system being developed can be programmed and reprogrammed to meet the changing needs of a growing child and can be used later to wean the patient from shunt dependence. Friedman said the system also would improve management of hydrocephalus and could reduce health care costs by decreasing the number of operations and by eventually weaning the patient from the shunt.

- end -

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# NASA News

National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

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**For Release:**

Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

July 28, 1986  
4:30 p.m. EDT

RELEASE NO: 86-100

## NASA RELEASES CHALLENGER TRANSCRIPT AND REPORT ON CAUSE OF DEATH

RADM Richard H. Truly, Associate Administrator for Space Flight, today released copies of the final report from Dr. Joseph P. Kerwin, Director of Life Sciences at the Johnson Space Center, Houston, on the investigation into the cause of death of the Challenger astronauts, along with a transcript of the operational recorder tape containing the internal communications among the members of the Challenger crew.

A thorough review of the wreckage and all other available data from the Challenger flight has been completed. NASA is unable to determine positively the cause of death of the Challenger astronauts but has established that it is possible, but not certain, that loss of consciousness did occur in the seconds following the orbiter breakup.

The voice tape transcript contains the comments of Challenger astronauts Francis R. Scobee, Michael J. Smith, Ellison S. Onizuka and Judith A. Resnik for the period from 2 minutes, 5 seconds prior to launch through loss of data.

NASA's announcement on July 17, 1986, stated that the initial review of the voice tape indicated that the crew was unaware of the events preceeding the breakup of the orbiter. Detailed analysis showed that the final comment on the tape provided the first potential indication of awareness on their part at the moment when all data was lost at 73 seconds into the flight.

Admiral Truly stated, "Many dedicated people, both from within NASA and from other agencies, have devoted long hours and many months, first to recover the Challenger crew module from the ocean floor, and then to examine all available evidence to establish the cause of death of the crew. Their work deserves the admiration and thanks of the American people, and I believe their efforts have now closed this chapter of the Challenger loss. We have now turned our full efforts to the future, but will never forget our seven friends who gave their lives to America's space frontier."

# NASA News

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For Release:

Azeezaly S. Jaffer  
Headquarters, Washington, D.C.  
(Phone: 202/453-1922)

July 31, 1986

RELEASE: 86-102

## CENTERS FOR COMMERCIAL DEVELOPMENT OF SPACE NAMED

The National Aeronautics and Space Administration today announced the teams selected under the second program solicitation to establish Centers for the Commercial Development of Space.

The centers are joint undertakings of government, industry and academic teams which will work closely with NASA field centers. The centers are:

- \* University of Wisconsin, Madison  
Space Automation and Robotics  
Dr. John Bollinger
- \* Ohio State University, Columbus  
Real Time Satellite Mapping  
Ivan Mueller
- \* University of Houston, Texas  
Molecular Beam Epitaxy  
C.W. Chu
- \* Clarkson University, Potsdam, N.Y.  
Commercial Crystal Growth in Space  
William Wilcox

In naming this year's teams, Isaac T. Gillam IV, Assistant Administrator for Commercial Programs, said: "This selection is a reaffirmation of NASA's continued support of the Commercial Development of Space. These selectees are expected to make a valuable contribution to our efforts."



The four teams were selected from 25 proposals submitted to NASA based on:

- \* New and unique research leading to commercial activity requiring the space environment.
- \* Management teams that are capable of selecting and directing research projects that are commercially oriented.
- \* Available non-NASA resources to help operate the center, including the commitment of industrial resources.

NASA will fund the centers for a period not to exceed 5 years at which time they are expected to be self sustaining.

Funding for each center will be approximately \$1 million per year for 5 years. Selection constitutes authorization for the first year funding. Additional funding will depend on a favorable annual review of progress in stimulating commercial ventures in space.

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# NASA News

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Mark Hess  
Headquarters, Washington, D.C.  
(Phone: 202/453-1192)

**For Release:**

July 31, 1986

RELEASE NO: 86-103

## SPACE STATION PROGRAM STATEMENT

Dr. James C. Fletcher, NASA Administrator, today issued the following statement concerning the Space Station program after a press briefing he attended with Senators Phil Gramm of Texas and Jake Garn of Utah:

"Over the last few days, I have spent considerable time studying the Space Station program in great detail.

"Today, I'd like to acknowledge that NASA did not sufficiently consult with the Congress on decisions pertaining to Space Station management prior to the announcement on June 30 of those decisions.

"Considerable misunderstanding and misinterpretation of the intent of the decision on the Space Station work package realignment has resulted. Therefore, I have decided not to implement that decision for a period of up to 90 days.

"I intend to conduct a thorough review of all aspects of Space Station design, work package assignments and functions, and conduct extensive conversations with Members of Congress during this period so there will be a complete understanding of the direction we plan to go."

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For Release:

Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

August 1, 1986

## NOTE TO EDITORS:

The Lunar and Planetary Laboratory, University of Arizona, Tucson, in cooperation with NASA's Johnson Space Center, Houston, will conduct a Planet Mercury Conference, Aug. 6-9, 1986 at the Ventana Canyon Resort, Tucson, Ariz.

It has been more than a decade since the last Planet Mercury Conference was held. Since that time, a significant amount of new data has been developed. The conference planners hope to interpret the data and put it into proper perspective.

Conference topics include:

- \* Mercury's role in understanding the origin of planets.
- \* Mercury as an end-member planet.
- \* Ground-based and Earth-orbital observations of Mercury.
- \* Possible spacecraft missions to the planet.

For additional information, media may contact the Mercury conference co-organizers:

Clark R. Chapman  
Planetary Science Institute  
2030 E. Speedway, Suite 201  
Tucson, Ariz. 85719  
602/881-0332

Faith Vilas  
Johnson Space Center  
Code: SN3  
Houston, Texas, 77058  
713/483-2956

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# NASA News

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Mark Hess  
Headquarters, Washington, D.C.  
(Phone: 202/453-1192)

For Release:

August 1, 1986

RELEASE NO: 86-104

## NASA AND ESA REACH SPACE STATION PHASE B PROGRAM LEVEL AGREEMENT

The National Aeronautics and Space Administration and the European Space Agency (ESA) announced today they have reached agreement on hardware elements of the Space Station that ESA will carry into preliminary design.

As ratified by NASA Administrator Dr. James C. Fletcher and ESA Director General Professor Reimar Luest, the agreement marks a major milestone in defining specific Space Station elements in preparation for beginning development of the project next spring.

The agreement calls for ESA to conduct preliminary design of a permanently-attached pressurized laboratory module and a polar orbiting platform for the remainder of the definition and preliminary design study (Phase B) which extends through early 1987.

Discussion and negotiation on technical details related to the outfitting of the permanently-attached laboratory will continue through the remainder of the Phase B studies. The polar-orbiting platform will be used primarily for Earth observation.

ESA will conduct preliminary design of a man-tended free-flyer (pressurized module and resource module) for international utilization primarily in the fields of material and life sciences and fluid physics, requiring a long-duration undisturbed micro-gravity environment.

In addition, NASA and ESA jointly will study the man-tended free-flyer. This joint study, to be completed by January 1987, will concentrate on user requirements and developmental and operational impacts on the Space Station as a whole and will provide a basis for determination of the utility of the man-tended free-flyer to the Space Station system.

ESA also will study a coorbiting platform based on an enhanced version of their European Retrievable Carrier (EURECA). This platform initially will be ground based. But when the Space Station is operational, the platform will be serviced at the Space Station.

The present agreement only covers the remainder of the Phase B period and does not obligate ESA to develop this hardware. The undertaking of a cooperative program to cover development of the hardware elements will be subject to satisfactory negotiation of an agreement for cooperation in the development, operation and utilization of the Space Station system.

At the direction of President Reagan, NASA is developing a permanently manned Space Station, designed for operation in the mid 1990s, and has invited friends and allies of the United States to participate in the project. As part of that effort, NASA is conducting an 18-month definition and preliminary design study (Phase B) to better understand the technical content, schedule and cost of the program before proceeding with development. A baseline configuration for the Space Station was announced in May 1986, marking the end of the definition phase and the beginning of the preliminary design phase.

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Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

**For Release:**  
August 5, 1986

Maurice Parker  
Langley Research Center, Hampton, Va.  
(Phone: 804/865-2934)

RELEASE: 86-105

## CLOUDS MAY OFFSET "GREENHOUSE EFFECT"

Recent measurements of Earth and its atmosphere by NASA scientific instruments indicate that clouds may have a significant effect on our climate and weather patterns.

Preliminary data from NASA's Earth Radiation Budget Experiment (ERBE) suggests that clouds reflect more heat than they retain. Clouds appear to cool Earth's climate, possibly offsetting the atmospheric "greenhouse effect."

The ERBE instruments measure Earth's heat "budget," the amount of sunlight that reaches and is absorbed by Earth and the amount of energy radiated back to space. Even small changes in any component of the budget can have important effects on weather and climate. The instrument's accuracy in identifying clouds and clear parts of the atmosphere is helping to resolve many scientific questions about the future of Earth's climate.

Scientists have long known that the atmosphere acts as a greenhouse, letting in sunlight and preventing much of the heat from escaping. The greenhouse effect has been expanding for the past 50 years. The problem will increase with the continued use of fossil fuels that release carbon dioxide into the atmosphere, blocking heat from escaping to space.

The anticipated change in the greenhouse effect caused by increased carbon dioxide is less than about 1 percent. Scientists believe that even this small amount of change will be significant and could be associated with droughts and rising sea levels. However, reliable estimates are not yet possible of how the Earth's climate will be altered by the greenhouse effect.

Winds and ocean currents are another important influence on Earth's climate because they are closely related to the flow of energy from the sun to the Earth and space. Some scientists think that changing cloud patterns will alter the energy flow and influence the amount of heat stored in the ocean, thereby modifying the movement of heat from one part of the ocean to another.

Earth's energy budget has been studied for decades with sounding rockets, balloons and satellites. However, the studies have been limited by incomplete coverage and sporadic observations.

ERBE is a three-satellite project that began in October 1984, when ERBS was deployed into orbit from the Shuttle Challenger.

A second ERBE instrument package is aboard NOAA-F, a National Oceanic and Atmospheric Administration weather satellite launched into polar orbit in December 1984. A third ERBE package is scheduled to be sent into polar orbit aboard the NOAA-G satellite later this year.

The ERBE instruments measure the average monthly heat budget on regional, zonal and global scales; track the seasonal movement of heat from the tropics to the poles and determine the average daily variation in heat on a 620-mile regional and a monthly scale.

Each ERBE package contains two radiometer instruments called a scanner and a non-scanner. The scanner is a narrow field-of-view scanning radiometer that makes shortwave measurements of reflected solar energy and longwave measurements of Earth-emitted energy.

The non-scanner has two wide field-of-view sensors that view the entire disc of Earth from limb to limb, two medium field-of-view sensors that view a 10-degree region of Earth and a solar monitor that measures the total output of the sun's radiant energy.

The ERBE satellites were developed by NASA's Goddard Space Flight Center, Greenbelt, Md. The ERBE instruments were developed by scientists and engineers at NASA's Langley Research Center, Hampton, Va. The Atmospheric Sciences Division at the Langley center maintains scientific management responsibility for the program.

For the next several years, a team of scientists from around the world will continue to examine ERBE data in an attempt to improve understanding of the global heat flows that interact to keep Earth's climate in balance.

- end -

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Photographs to illustrate this news release will be distributed without charge to media representatives. Photographs may be obtained by writing or calling:

Broadcast and Audio/Visual Branch, LFD-2  
NASA Headquarters, Washington, D.C., 20546

(Phone: 202/453-8594)

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# NASA News

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Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202.453-8536)

**For Release:**

August 5, 1986  
10:30 a.m. EDT

RELEASE NO: 86-106

THOMPSON APPOINTED DIRECTOR, MARSHALL SPACE FLIGHT CENTER

Dr. James C. Fletcher, NASA Administrator, today announced the appointment of James R. Thompson as Director of the Marshall Space Flight Center, Huntsville, Ala., effective in late September.

Thompson, 50, has been the deputy director for technical operations at the Princeton Plasma Physics Laboratory since April 1983. From March to June of this year he served as the vice-chairman of the NASA task force inquiring into the cause of the Space Shuttle Challenger accident. In this capacity he headed the day-to-day operations of the 51-L Data and Design Analysis Task Force, which collected and analyzed accident-related information in support of the Presidential Commission on the Space Shuttle Challenger Accident.

Before assuming his position at Princeton University, Thompson spent 23 years with NASA at Marshall, where he managed development of the Space Shuttle's main engines for eight years. He also worked in the Skylab program and was Associate Director of Engineering for the center.

Upon announcing the appointment, Dr. Fletcher said, "We are very fortunate to have J.R. take on this assignment which is so critical to NASA's continuing position of leadership in space exploration. I view his appointment as another positive step in the process of safely returning the Space Shuttle to flight. His extensive and varied experience makes him eminently qualified to assume this post, and I know I speak for the entire Agency in welcoming him back to NASA."

- end -

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**For Release:**

Kenneth Atchison  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

August 6, 1986

RELEASE: 86-107

## Astronaut Hauck Named Deputy For NASA External Relations

Dr. James C. Fletcher, NASA Administrator, today announced the appointment of astronaut Frederick (Rick) Hauck as the Deputy Associate Administrator for External Relations effective August 11.

In this position, Hauck will share responsibility for policy level management, direction and coordination of the agency's relationships with public and private organizations both domestic and international. This includes the news media, other federal agencies, state and local governments, foreign governments, international agencies, industry and private individuals.

A Navy captain, Hauck was selected as an astronaut candidate by NASA in January 1978. He was commander of STS-51A and pilot for STS-7. He also was a member of the support crew for STS-1 and re-entry capsule communicator on the support crew for STS-2.

Born April 11, 1941, in Long Beach, Calif., Hauck received a bachelor of science degree in physics from Tufts University in 1962 and a master of science degree in nuclear engineering from the Massachusetts Institute of Technology in 1966.

A Navy ROTC student at Tufts, he served 20 months as communications officer and combat information center officer aboard the destroyer USS Warrington. After receiving his wings in 1968 from the Naval Air Station in Pensacola, Fla., he flew 114 combat and support missions in Southeast Asia while stationed aboard the carrier USS Coral Sea. In 1970, Hauck was selected for test pilot training at the U.S. Naval Test Pilot School, Patuxent River, Md.

-more-

Hauck has flown various aircraft including the A-6, A-7 and F-14. He has been awarded 9 Air Medals, the Navy Commendation Medal with Gold Star and Combat V and the NASA Space Flight Medal. He also was named Outstanding Test Pilot for 1972.

Captain Hauck is married and has two children.

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James F. Kukowski  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

**For Release:**  
August 7, 1986  
2:30 p.m., EDT

James Elliott  
Goddard Space Flight Center, Greenbelt, Md.  
(Phone: 301/286-6256)

Dr. Mark Littmann  
Space Telescope Science Institute, Baltimore, Md.  
(Phone: 301/338-4757)

RELEASE: 86-108

## AMATEUR ASTRONOMERS TO HAVE OBSERVING TIME ON SPACE TELESCOPE

NASA and the Space Telescope Science Institute, Baltimore, Md., announced today that U.S. amateur astronomers will be given the opportunity to make observations with the Hubble Space Telescope (HST).

The announcement was made by Dr. Riccardo Giacconi, director of the institute, which is under contract to NASA. He said that a small amount of observing time is being reserved for amateurs from the director's discretionary time, which is set aside for astronomical targets of opportunity.

Dr. Giacconi said that amateur astronomers also could use Space Telescope data and picture archives and conduct cooperative observation projects, using their own telescopes for observations in concert with Space Telescope observations.

With a 94-1/2 inch mirror, the HST will be the largest astronomical telescope ever placed in space. Because it will be above the Earth's atmosphere, astronomers expect the telescope to detect celestial objects 50 times fainter and see them with 10 times the clarity of ground-based telescopes.

-more-

Amateur astronomers have made significant contributions to astronomy since the telescope was invented nearly 4 centuries ago. There are at least a quarter million amateur astronomers in the U.S.

In announcing this program, Dr. Giacconi said, "The professional astronomy community is deeply grateful to amateur astronomers for decades of valuable assistance in our observational programs and for helping to interpret our findings to the public at large. I look to amateur astronomers to ask refreshingly new questions and I expect that they will make a real contribution to the advancement of astronomy."

To explore and implement cooperative scientific efforts with the HST project on behalf of amateur astronomers, the following nationally recognized leaders of amateur astronomer activities have agreed to serve as the Hubble Space Telescope Amateur Astronomers Working Group:

Dr. David W. Dunham	President, International Occultation Timing Association
Stephen J. Edberg	President, Western Amateur Astronomers
Jesse B. Eichenlaub	President, Independent Space Research Group
George D. Ellis	President, Astronomical League
Dr. Janet A. Mattei	Director, American Association of Variable Star Observers
Gerald Persha	International Amateur-Professional Photoelectric Photometry
Dr. John E. Westfall	Acting Director, Association of Lunar and Planetary Observers

Plans by the working group for soliciting and evaluating amateur astronomer proposals for use of the HST will be announced shortly. The working group has selected Stephen J. Edberg as its chairman. Mike Potter, research assistant at the Space Telescope Science Institute, is serving as project advisory officer.

On behalf of the Hubble Space Telescope Amateur Astronomers Working Group, Edberg responded, "We are grateful for the trust that NASA, the Space Telescope Science Institute and Dr. Giacconi have shown in amateur astronomers. We look forward to continuing our long tradition of amateur contributions to astronomy as we join our professional colleagues in taking the next great step in the study of the cosmos."

The HST is a project of international cooperation between NASA and the European Space Agency (ESA). NASA's Marshall Space Flight Center, Huntsville, Ala., is the lead center for the development of the Hubble Space Telescope. NASA's Goddard Space Flight Center, Greenbelt, Md., is responsible for development of American scientific instruments aboard the Hubble Space Telescope, for spacecraft operations and management of the Space Telescope Science Institute. ESA has furnished the Space Telescope with one of its instruments and its solar arrays for electrical power.

Prime contractor for the telescope optics was Perkin-Elmer Corporation, Danbury, Conn. Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif., was prime contractor for the HST and support systems. The scientific instruments for Space Telescope were designed by teams of scientists and constructed by aerospace corporations, NASA centers and universities.

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Barbara E. Selby  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

**For Release**  
August 11, 1986

Lisa Malone  
Kennedy Space Center, Fla.  
(Phone: 305/867-2468)

RELEASE: 86-109

## PROPOSALS RECEIVED FOR PAYLOAD GROUND OPERATIONS CONTRACT

Two companies have submitted proposals for the Payload Ground Operations Contract (PGOC), the third and last in a series of comprehensive contracts to be awarded by NASA Kennedy Space Center, Fla., to fulfill Space Transportation System operational objectives.

Boeing Aerospace Operations, Cocoa Beach, Fla., and McDonnell Douglas Astronautics Co., Kennedy Space Center, Fla., submitted competing proposals on Aug. 5. About 70 solicitation packages were sent out, some of which were for sub-contractor opportunities.

The request for proposals was issued May 6, 1986, and the contract award date is scheduled for mid-December.

The contractor selected will be responsible for preparing all payloads, such as communications satellites, scientific experiments and Spacelabs, for launch aboard Space Shuttles and expendable launch vehicles. The contract includes assembly, testing, checkout and transporting payloads while at KSC.

Other contract work includes the operations, maintenance and engineering of the related processing facilities.

Among these are the payload areas in the Operations and Checkout Building, the Vertical Processing Facility, several spacecraft checkout hangers, facilities for loading spacecraft propellants and a NASA telemetry facility on Cape Canaveral Air Force Station.

- more -

Future Space Station components that require launch processing at KSC and preparation of NASA payloads to be launched at the Vandenberg Launch Site also are within the scope of work.

The contract will consolidate work currently performed under separate on-site contracts involving about 900 people. The majority of current payload processing activity is performed by McDonnell Douglas with Boeing Aerospace, Computer Science Corp., EG&G Florida and Planning Research Corp. also doing a portion of the work.

The initial 3-year cost-plus-award-fee contract has optional extensions, giving the contract a possible life of up to 15 years. The contract start date is estimated to be Jan. 1, 1987.

The purpose of the PGOc is to obtain a single, long-term contract for payload processing activities. It reduces the cost and the necessary number of contract interfaces while increasing efficiency, effectiveness and safety.

Two other major contracts KSC has awarded are the Base Operations Contract (BOC) and the Shuttle Processing Contract (SPC). The BOC was awarded to EG&G, Inc., Wellesley, Mass., on Nov. 29, 1982. Lockheed Space Operations Company, Titusville, Fla., was awarded the SPC contract on Sept. 29, 1983.

The BOC consolidated institutional and certain technical support services covering utilities, facilities, administrative services, technical operations and health and safety services being provided by 14 different contractors.

The SPC consolidated 13 contracts providing launch processing and landing services for all Shuttle flight hardware and maintenance of related ground systems to NASA and the USAF at Vandenberg Air Force Base, Calif.

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**For Release:**

August 11, 1986

Ken Atchison  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

RELEASE NO: 86-110

## CHAIRMAN, NASA ADVISORY COUNCIL RECEIVES AWARD

Daniel J. Fink, President of D. J. Fink Associates, has been awarded the NASA Distinguished Public Service Medal for his services as Chairman of the NASA Advisory Council, the agency's senior advisory body.

The Distinguished Public Service Medal, the highest honor given to non-NASA individuals, was presented to Fink on August 4, 1986 by NASA Administrator James C. Fletcher.

In receiving the award, Fink was recognized for his leadership of NASA's advisory bodies, which have been instrumental in stimulating NASA's pace-setting program for the Shuttle flight of private citizens, organizing the promotion of the commercial use of space, and providing the definition of the new Earth Science program.

Daniel J. Fink received a bachelor's and master's degrees in Aeronautical Engineering from MIT, the latter in 1949. He was employed by Bell Aircraft as a group leader in Aircraft Dynamics and by Allied Research Associates, where he rose to Vice President.

From 1963 to 1967, he served as Deputy Director of Defense Research and Engineering for Strategic and Space Systems and Assistant Director for Defensive Systems, DOD.

He joined the General Electric Company in 1967, where he was Vice President and General Manager, Space Division; Vice President and Group Executive, Aerospace Group; and Senior Vice President, Corporate Planning and Development. He retired from GE in 1982 to establish his own consulting firm.

- end -

# NASA News

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**For Release:**

August 18, 1986

Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

Terry Eddleman  
Marshall Space Flight Center, Huntsville, Ala.  
(Phone: 205/544-0034)

RELEASE NO: 86-111

## NASA AWARDS CONTRACT TO STUDY EXTERNAL TANK CONVERSION

NASA's Marshall Space Flight Center, Huntsville, Ala., has awarded a 7-month, \$93,000 contract to Martin Marietta Corp., New Orleans, to study the feasibility of converting a Space Shuttle external tank to an orbiting telescope.

According to Max Nein, advanced systems division at Marshall, the proposal to transform the external tank into a Gamma Ray Imaging Telescope (GRIT), to study gamma ray sources in the Universe, appears possible. Studies have determined that the spent tanks, 154-feet long and 27.6 feet in diameter, could be carried into orbit rather than discarded just before the Shuttle achieves orbit. Components of the telescope would be carried in the Shuttle's cargo bay along with other payloads. Because the telescope would require periodic maintenance, it probably would orbit near the planned Space Station, 230 to 345 miles above Earth. The proposal was initiated by Dr. David Koch, Astrophysical Observatory, Smithsonian Institution, Cambridge, Mass.

"Once in space, residual propellents would be expelled from the tank and astronauts could assemble telescope components within the liquid hydrogen tank. They could enter the tank via an existing 36-inch aft manhole port or through tank modification. The tank then would be pressurized to provide the needed environment for the gamma ray detection technique," Nein said.

In operation, gamma rays would be converted by a lead plate into positrons and electrons which travel the length of the telescope emitting light. The light would be imaged onto a detector by a large mirror spanning the diameter of the tank. Since gamma rays reflect the highest energy processes, gamma ray astronomy is essential to understanding the evolution of stars and the Universe and to the physical processes occurring in pulsars, quasars and black holes.

Nein said NASA plans to conduct a separate gamma ray survey using the orbiting Gamma Ray Observatory (GRO). The Gamma Ray Imaging Telescope would follow up the work of the GRO by enabling NASA to conduct even more detailed gamma ray studies.

"We hope the feasibility study now in progress will help us learn more about meeting the scientific and engineering challenges related to turning the external tank into a valuable resource for the space-based study of gamma ray astronomy," Nein concluded.

Martin Marietta manufactures the Shuttle external tank under contract to MSFC, at NASA's Michoud Assembly Facility, New Orleans, where the study is being performed.

- end -

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**For Release:**

Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

August 13, 1986  
4:00 p.m. EDT

Bob Ruhl  
Marshall Space Flight Center, Huntsville, Ala.  
(Phone: 205/544-0034)

RELEASE: 86-112

## NASA SELECTS PRATT & WHITNEY FOR ALTERNATE TURBOPUMP DEVELOPMENT

The National Aeronautics and Space Administration today announced the selection of United Technologies, Pratt & Whitney Aircraft, Government Products Division, West Palm Beach, Fla., for negotiations leading to a contract award for the design, development, test, flight certification and production verification of alternate high-pressure fuel and oxydizer turbopumps. These turbopumps are intended to be interchangeable with the current Space Shuttle main engine turbopumps, provide extended life capability and enhance safety margins.

A cost-plus-award-fee contract is anticipated. Pratt & Whitney's proposal reflected a cost of approximately \$182 million and a period of performance of 5 to 6 years.

One other firm submitted a proposal: Aerojet TechSystems Company, Sacramento, Calif.

The contract will be managed by NASA's Marshall Space Flight Center, Huntsville, Ala.

- end -

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# NASA News

National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

Debra J. Rahn  
Headquarters, Washington, D.C.  
(Phone: 202/453-2754)

**For Release:**  
August 19, 1986

RELEASE: 86-113

## NASA/DOD HYBRID RESEARCH AIRCRAFT ROLLED OUT

The X-Wing Rotor Systems Research Aircraft, developed by the Defense Advanced Research Projects Agency (DARPA), NASA and Sikorsky Aircraft, was rolled out in formal ceremonies today in Stratford, Conn., marking a major advance in aeronautical engineering.

X-wing technology promises to provide an efficient combination of the vertical lift and stable hover characteristics of conventional helicopters with the high cruise speed of fixed-wing aircraft.

Future X-wing aircraft could take off and land vertically using a helicopter-like rotor. Once in the air and moving forward at speeds from 180 to 200 knots, the four-bladed rotor/wing would be stopped in mid-flight to function as a fixed, X-shaped (as viewed from above) wing aircraft. Two blades would be swept forward at 45 degree angles, and two would be swept to the rear at the same angles. The purpose of the X-Wing Rotor Systems Research Aircraft Program is to demonstrate in flight these rotor/wing starting and stopping conversions.

Engineers and developers do not foresee the X-wing aircraft replacing either conventional fixed-wing or rotary-wing aircraft. Instead, it is envisioned that X-wing aircraft will provide enhanced capabilities to perform missions which call for the low-speed efficiency and maneuverability of helicopters, combined with the high cruise speed of fixed-wing aircraft. Potential missions include air-to-air and air-to-ground tactical operations, airborne early warning, electronic intelligence, antisubmarine warfare and search rescue.

The DARPA/NASA X-wing system is mounted on a modified NASA/Army Rotor System Research Aircraft (RSRA) built by Sikorsky in 1978 to be a "flying wind tunnel" for testing advanced rotor concepts.

The RSRA has a 45-foot, variable-incidence conventional wing which can support the full weight of the aircraft in flight, thus allowing tests to begin with low X-wing lift. As flight testing progresses, more load will be placed on the X-wing. Data from the two wings can be monitored separately to give flight test engineers precise performance information.

The X-Wing RSRA will be shipped to NASA Dryden Flight Research Facility, Edwards, Calif., in September to begin its 15-month flight test program later this fall.

- end -

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

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For Release:

Barbara Selby  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

August 18, 1986

RELEASE NO: 86-114

## ASTRONAUT RIDE NAMED SPECIAL ASSISTANT FOR STRATEGIC PLANNING

Dr. Sally K. Ride has been detailed to the position of Special Assistant to the Administrator for Strategic Planning. In this position, she will be responsible for reviewing NASA's goals and objectives for near to long-term planning.

Ride was selected by NASA as an astronaut candidate in 1978. She has been a mission specialist on two Space Shuttle flights -- STS-7 in June 1983 and STS 41-G in October 1984. Recently she served as a member of the Presidential Commission on the Space Shuttle Challenger Accident.

A native of Los Angeles, Ride is a graduate of Stanford University, where she received a B.S. degree in physics and a B.A. degree in English in 1973, and M.S. and Ph.D. degrees in physics in 1975 and 1978, respectively.

-end-

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

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## For Release:

James Kukowski  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

August 19, 1986

## NOTE TO EDITORS: NOAA-G ENVIRONMENTAL SATELLITE LAUNCH

The NOAA-G environmental monitoring satellite is scheduled for launch from Vandenberg Air Force Base, Calif., Saturday, Aug. 30, 1986, during a 10-minute window beginning at 11:47 a.m., EDT (8:47 a.m., PDT). The satellite, aboard an Atlas-E launch vehicle, will lift off from Space Launch Complex 3 West.

A NOAA-G mission news conference will be held at 10:30 a.m., PDT, Tuesday, Aug. 26, in the Tower Restaurant, TransAmerica Building, 1150 South Olive Street, Los Angeles, Calif.

NOAA-G is the seventh in a series of eight satellites developed to give scientists the most comprehensive meteorological and environmental information since the start of the Nation's space program, transmitting data directly to users around the world for local weather analysis.

Accredited news media desiring to attend the launch should register at the NASA newscenter in The Inn of Lompoc, 1122 North H Street, Lompoc, Calif., Friday, Aug. 26, from 2:00 to 8:00 p.m. A prelaunch news briefing will be conducted at 4:00 p.m., PDT, Friday, Aug. 29, 1986.

The newscenter will re-open Saturday morning, launch day, August 30 at 5:00 a.m., PDT, to continue media processing.

NO PRIVATE VEHICLES will be permitted on Vandenberg Air Force Base. All media will be issued badges before boarding buses to the viewing site.

Advance accreditation may be accomplished by writing NASA Public Affairs, P.O. Box 425, Lompoc, Calif., 93438 or by calling NASA Public Affairs 805/865-3053. Those planning to cover the launch should notify Jim Elliott, Dave Thomas or Walt Dundon at that Public Affairs phone number.



Beginning Monday, Aug. 25, recorded information on the progress of the prelaunch preparations and countdown will be available on the NASA news service "information repeater", telephone 805/865-3456.

Television coverage of the launch will begin approximately 30 minutes before liftoff. The video and launch commentary will be carried over NASA Select TV on RCA Satcom F2R, transponder 13 (72 degrees west longitude).

- end -

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

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Mark Hess  
Headquarters, Washington, D.C.  
(Phone: 202/453-1192)

**For Release:**  
August 20, 1986  
1 p.m. EDT

RELEASE: 86-116

## NASA ANNOUNCES PLAN FOR SPACE STATION REVIEW

NASA Associate Administrator for the Office of Space Station Andrew J. Stofan announced today the formation of two teams to review Space Station design and work package assignments and functions.

A Space Station Configuration Critical Evaluation Task Force, headed by W. Ray Hook, Manager, Space Station Office at NASA's Langley Research Center, Hampton, Va., will conduct a technical review of Space Station architecture and systems. The task force will conduct their activities at Langley. An Executive Technical Committee, headed by Stofan, will provide oversight and guidance to the task force and will assess the impact of any design modifications or changes on individual NASA center and contractor roles.

Stofan's actions are in response to NASA Administrator James C. Fletcher's July 31 directive to conduct a thorough review of all aspects of Space Station design and to hold off the implementation of work package realignment for a period of up to 90 days.

Approximately 35 people will serve on the task force full time. Several hundred more will take part in the technical evaluation, including NASA personnel from the work package centers and from outside of the program, Phase B contractors, and representatives from user groups and the international partners.

The Executive Technical Committee will include representatives from engineering organizations at the five prime Space Station centers, the flight crew office and the user community. The acting Space Station program manager and project managers from the five Space Station centers also will serve on this committee.

The task force will critically examine all aspects of the current Space Station baseline configuration. It will evaluate the configuration in terms of the amount of extravehicular activity required for assembly and maintenance of the station, launch capacity of the shuttle fleet when again operational, assembly sequence of the baseline configuration, any resultant impact to the utilization of the station, potential impact on international partners and overall technical performance and integrity of the station.

The Executive Technical Committee will approve the assumptions, engineering and technical constraints identified by the task force and will oversee their activities. The committee will examine work package assignments from the standpoint of changes required due to the impact of any design iterations, minimizing development costs and achieving simple, controllable interfaces.

Results of the overall evaluation will be factored into the request for proposals to be released to industry in the next fiscal year beginning Oct. 1, 1986. Selection of contractors to design, build and test Space Station hardware is scheduled to take place in 1987.

President Reagan, in his 1984 State of the Union message, directed NASA to develop a permanently manned Space Station within a decade. The Space Station, comprised of a manned base and unmanned platforms, will provide a multi-purpose facility in low-Earth orbit for the conduct of science, technology and commercial activities.

- end -

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# NASA News

National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

David W. Garrett  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

**For Release:**

Aug. 20, 1986  
11:00 a.m. EDT

RELEASE: 86-117

## MCCARTNEY NAMED KENNEDY SPACE CENTER DIRECTOR

Lt. Gen. Forrest S. McCartney, Commander of the Space Division, Air Force Systems Command, Los Angeles, has been named Director of the Kennedy Space Center, Fla. On assignment from the Air Force, he is expected to report to NASA on approximately October 1.

"General McCartney's close association with our nation's space program and his outstanding management record make him an excellent choice to become director of the Kennedy Space Center. I am pleased that the Air Force has allowed him to take on this assignment with NASA," said NASA Administrator James C. Fletcher.

McCartney succeeds Richard G. Smith who retired from NASA on July 31, 1986.

Born March 23, 1931, in Ft. Payne, Ala., McCartney received a bachelor of science degree in electrical engineering from the Alabama Polytechnic Institute, Auburn, in 1952 and earned a master's degree in nuclear engineering from the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, in 1955. He also is a graduate of the Armed Forces Staff College, Norfolk, Va.

McCartney's Air Force assignments have included the Satellite Control Facility, Sunnyvale, Calif., as a satellite controller during early space operations; the Office of Space Activities, Headquarters Air Force Systems Command, Andrews Air Force Base, Md., as a project officer in the Titan III program and various Air Force communication satellite programs; the Directorate of Space at Headquarters U.S. Air Force, Washington, D.C., as the program element monitor for satellite communications programs and other selected space-related efforts; and the Air Force Eastern Test Range, Patrick Air Force Base, Fla., as director of range engineering.

In June 1974, McCartney was assigned to the Space and Missile Systems Organization at Los Angeles Air Force Station as the systems program director for Fleet Satellite Communications Systems. In August 1976, he was reassigned within the organization as deputy for space communications systems.

McCartney moved to Norton Air Force Base, Calif., in September 1979, as vice commander of the Ballistic Missile Office and was named commander of the Ballistic Missile Office and M-X program director in November 1980. He became vice commander of the Space Division in May 1982 and commander, Space Division and vice commander, Space Command in May 1983. Upon activation of the U.S. Space Command, he was redesignated commander of the Space Division in October 1985.

His military decorations and awards include the Distinguished Service Medal, Legion of Merit with one oak leaf cluster, Meritorious Service Medal and Air Force Commendation Medal with three oak leaf clusters. He also wears the master missile badge and the master space badge.

McCartney and his wife, the former Ruth Griffis of Memphis, Tenn., have two daughters, Margaret and Worthy.

-end-

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

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Leon Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

Joyce Milliner  
Wallops Flight Facility, Va.  
(Phone: 804/824-1579)

Jim Elliott  
Goddard Space Flight Center, Greenbelt, Md.  
(Phone: 301/286-6256)

**For Release:**

August 27, 1986

RELEASE: 86-119

## NASA SOUNDING ROCKET DESTROYED BY RANGE SAFETY OFFICER

A NASA Aries sounding rocket, carrying a scientific payload, was destroyed by range safety at the White Sands Missile Range (WSMR) N.M., Saturday, Aug. 23. NASA officials said there appeared to be a problem in the launch vehicle's guidance system. The order to "destruct" came 50 seconds after liftoff, at 12:40 a.m., EDT at an altitude of 77,000 feet. Portions of the destroyed vehicle and associated systems have been recovered and the search is being continued.

A 2,300-pound X-ray telescope designed to study distant stellar objects emitting soft X-rays was to have reached an altitude of 182 statute miles and take data for approximately six minutes. No useful data were returned.

All vehicle and payload hardware were confined safely within the missile range boundaries. An investigation into the failure is underway.

The Aries is a NASA/Department of Defense-developed launch vehicle which uses a military surplus booster. It was built by Space Vector Corp., Northridge, Calif.

-more-

Of its 27 flights, the first of which took place at St. Nicholas Island, Calif., in 1973, 11 have been for NASA and the others for the Air Force and the Department of Defense.

There have been three failures in the series, the last taking place on flight five in April 1976 from Kiruna, Sweden.

The payload was developed jointly by Dr. Gordon Garmire of Pennsylvania State University and, Drs. R. Novick and William Hain-Min Ku, of Columbia University.

This mission was a part of the overall NASA sounding rocket program, which is managed by the Wallops Flight Facility of the Goddard Space Flight Center, Greenbelt, Md. The sounding rocket program consists of 40 to 45 missions a year that are launched from various worldwide locations.

-end-

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

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Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

**For Release:**  
August 27, 1986  
2:00 p.m. EDT

RELEASE NO: 86-120

## NASA ANNOUNCES DISPOSITION OF SHUTTLE MISSION 51-L FLIGHT MEMENTOS

During the mission 51-L salvage operation, several items from the Official Flight Kit (OFK) and Personal Preference Kits (PPK) were recovered. Some of the recovered OFK items were flown for and will be presented to specific institutions or organizations, while others were flown by NASA without predetermined recipients, in anticipation of the presentation of post-flight awards and mementos.

The PPKs contained personal items flown at the request of each individual crew member and those items recovered will be returned to the crew families.

NASA will suitably prepare and present to each state and territory one 51-L crew patch, one United States flag and the respective state or territory flag, with a request that these items which were flown on 51-L be displayed appropriately in memorial to the crew. In addition, NASA will present one memento to the National Air and Space Museum, which is the national repository for items depicting the history of the space program.

NASA will present those recovered items which were flown for a specific organization or institution to the intended recipient. Where multiple items were flown, one will be presented and the remainder placed in permanent storage. NASA will announce the recipients of the items to be presented after all have been notified. All items not flown for a specific organization or institution will be placed in permanent storage in a location to be determined by the NASA Administrator.

In announcing the disposition of these items from the mission 51-L Official Flight Kit, Dr. James C. Fletcher, NASA Administrator, stated, "Since our space program is the nation's program, all its people should have a reminder of the Challenger and its crew. I believe that providing a suitable remembrance to each state and territory, as well as our National Air and Space Museum, serves this purpose."



Attached is a list of all items carried in the OFK. A list will be available describing those OFK items recovered and their recipients after recipients have been notified.

- end -

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CONTENTS OF 51-L OFFICIAL FLIGHT KIT

ITEM	CONTENT	ITEM	CONTENT
1-11.	Flags and Patches	49.	Patch
12.	Emblems	50.	Patch
13.	Etchings	51-53	Deleted prior to flight
14.	Patch and Flag	54.	Patch
15.	Deleted prior to flight	55.	Deleted prior to flight
16.	Video Disk	56.	Pin
17.	Flag	57.	Pin
18.	License Plate/Banner/Decals	58.	Flag
19.	Patches	59.	Flag
20.	Wings	60.	Flag
21.	Banner and Patch	61.	Flag
22.	Flag and Medallion	62.	Flag
23.	Book covers	63.	Medallion
24.	Piece of Glider Rib	64.	Medallion
25.	Medallion	65.	Diploma
26.	Floppy Disk/Medallion	66.	Medallion
27.	Medallion	67.	Picture
28.	Flags	68.	Flag
29.	Flag	69.	Flag
30.	Deleted prior to flight	70.	Flag
31.	Medallion	71.	Seal
32.	Deleted prior to flight	72.	Patches
33.	Soccer Ball	73.	Ring
34.	Seal	74.	Pin
35.	Flag	75.	Patch
36.	Badges/Buckles	76.	Pin
37.	Flag	77.	Pin
38.	Flag/Football	78.	Key
39.	Medallion	79.	Plaque
40.	Flag	80.	Patches
41.	Coffee Block	81.	Coin Sets
42.	Ceramic Star	82.	Patches
43.	Patches	83.	Decals
44.	Pennant	84.	Copies of Constitution
45.	Wings	85.	Certificates
46.	Patch	86.	Decals
47.	Deleted prior to flight	87.	Flag
48.	Patch		

# NASA News

National Aeronautics and  
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AC 202-453-8400

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**For Release:**

August 28, 1986

Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

Dick Young  
Kennedy Space Center, Fla.  
(Phone: 305/867-2468)

RELEASE NO: 86-121

SHUTTLE MISSION 51-L RECOVERY OPERATION ENDS

The massive marine salvage operation which began within hours of the Space Shuttle Mission 51-L accident on Jan. 28 will come to an end on Thursday, Aug. 28.

Rear Adm. Richard H. Truly, NASA Associate Administrator for Space Flight, said the three vessels currently engaged in the recovery - the Freedom Star, Liberty Star and Independence - will return to port at the end of the day on Aug. 28 to close the seven-month-long recovery effort.

The Department of Defense Managers' STS Contingency Support Office involved in the 51-L accident investigation will be terminated at the same time.

The U. S. Navy's salvage operation center at Cape Canaveral Air Force Station will also close.

Characterized as the largest ocean recovery operation in history, the 51-L effort consisted at its peak in February of 22 ships, 6,000 NASA, Air Force, Navy, Coast Guard and contractor personnel and numerous aircraft.

Working in the Atlantic Ocean in water up to 1,100 feet deep to the east and northeast of the Kennedy Space Center, the crews involved in the operation retrieved a large proportion of the orbiter Challenger and other shuttle flight systems.

According to Truly, the search yielded up from the sea about 45 percent of the Challenger, 50 percent of the external tank and twin solid rocket boosters, 95 percent of the Spartan-Halley spacecraft, 35 percent of the Tracking and Data Relay Satellite and 90 percent of the Inertial Upper Stage.

# NASA News

National Aeronautics and  
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**For Release:**

August 29, 1986

Azeezaly S. Jaffer  
Headquarters, Washington, D.C.  
(Phone: 202/453-1922)

RELEASE NO: 86-123

## NASA DEVELOPED TECHNOLOGY HELPS HANDICAPPED TO DRIVE

Technology developed by NASA during the Apollo moon landings is being utilized to create a vehicle control system that will permit the handicapped to regain their ability to drive. A joystick type control system called UNISTICK, when installed in a vehicle, will allow it to be operated safely on the open road. Recently, two drivers using only one hand for operation, traveled more than 3,300 miles in a van equipped with the UNISTICK control system.

The UNISTICK control system was inspired by the NASA Lunar Rover vehicle driven by astronauts on the moon. The vehicle's single control joystick permitted its easy operation by the astronauts as they gathered lunar samples for return to Earth.

The UNISTICK control system enables a driver to perform steering wheel, accelerator and brake pedal functions using only one hand. The parking brake is also set by positioning the joystick. No ordinary lower body limb mobility is required. The starter and gear selection switches are located on the primary control box and may be operated with push buttons and toggles.

The UNISTICK was developed by the Johnson Engineering Corp., Boulder, Colo., under a joint agency agreement with the U.S. Veterans Administration. The control system, under development since 1981, is now in its second generation. The company plans commercial production within the next year. It is anticipated that many handicapped persons, especially quadriplegics will welcome the NASA inspired device as means of regaining their freedom of independent travel.

- end -

Note: A video release to support this feature is available by contacting the NASA Headquarters Broadcast and Audio Visual Branch (Phone: 202/453-8375). Video Release-Report 241

To obtain a radio program on this subject, please call the NASA Broadcast News Service (202/269-6572)

# Key Personnel Change



Date: September 4, 1986

Subject: Appointment of Acting Associate Administrator and Deputy  
Associate Administrator for the Office of External Relations

Astronaut Frederick H. Hauck has been indefinitely detailed to the position of Acting Associate Administrator for External Relations, succeeding Thomas P. DeCair, who has been appointed Special Assistant to the Associate Administrator for Policy.

A Navy Captain, Hauck was selected as an astronaut candidate by NASA in January 1978. He was commander of STS-51A and pilot for STS-7. He also was a member of the support crew for STS-1 and re-entry capsule communicator on the support crew for STS-2.

Kenneth S. Pedersen has been appointed Deputy Associate Administrator for External Relations. His appointment will become effective in mid-October upon his return from Georgetown University where he has been detailed since October 1985 serving as research professor at the Institute for the Study of Diplomacy and teaching at the School of Foreign Service. In the position of Deputy, Mr. Pedersen will support the Associate Administrator in the areas of policy level management, direction and coordination of the Agency's relationships with public and private organizations, both domestic and international. This includes the news media, other federal agencies, state and local governments, foreign governments, international agencies, industry and private individuals.

Mr. Pedersen joined NASA in 1979 as Director, International Affairs Division, and in 1985, he was assigned to the position of Assistant Associate Administrator for External Relations. Before coming to NASA, Mr. Pedersen held several key managerial positions at various government agencies.

Both Captain Hauck and Mr. Pedersen were born in Long Beach, California, are married and have two children.



James C. Fletcher  
Administrator

# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

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For Release:

Gene Guerney  
Headquarters, Washington, DC  
(Phone: 202/453-8400)

September 5, 1986

NOTE TO EDITORS

## NASA AND AIAA PLAN SECOND QUALITY/PRODUCTIVITY SYMPOSIUM

The National Aeronautics and Space Administration in cooperation with the American Institute of Aeronautics and Astronautics (AIAA) will conduct a symposium on Quality and Productivity on December 2-3, 1986, at the Omni Shoreham Hotel, Washington, DC. Over 900 key executives from industry, government, and academia are expected to participate.

The symposium focuses on strategies for revitalizing organizations and provides a forum for discussing issues involved in increasing national quality and productivity.

A media room will be established at the Omni Shoreham Hotel. All media are invited to attend the symposium sessions free of charge. To receive accreditation for the symposium, media should contact Gene Guerny at the above phone number. Credentials may be picked-up at the symposium. The major symposium events will be televised live on NASA Select television and will be available to interested government agencies and other institutions.

- end -

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
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**For Release:**

September 8, 1986  
2:00 p.m. EDT

Azeezaly S. Jaffer  
Headquarters, Washington, D.C.  
(Phone: 202/453-1922)

RELEASE: 86-127

## BOEING SELECTED FOR SPACE COMMERCIAL DEVELOPMENT AND UTILIZATION

NASA has selected Boeing Aerospace Company, Seattle, Wash., for contract negotiations to develop and implement a program to stimulate and sustain interest by United States companies in the utilization and application of aeronautics and space technology.

"Use of the microgravity environment of spaceflight for research leading to commercial development, production and application of technologies and materials needed on Earth is a key to the Nation's future in the world economic market. Boeing Aerospace Company has been chosen by NASA to help assure that the United States plays a major role in this initiative," said Isaac T. Gillam, NASA Assistant Administrator, Office of Commercial Programs.

The contract is expected to be 1 year in duration with two 1-year options. Estimated contract value will be approximately \$1 million annually. Beginning in October, the work will be carried out by Boeing Aerospace Operations Company, Cocoa Beach, Fla.

The program's goal is to encourage U.S. firms, with private investment, to join with NASA to explore the application and utilization of new and innovative technologies for the mutual benefit of both parties.

Boeing will be aided by Peat Marwick, Mitchell & Co., New York City, the Nation's largest management and accounting firm. Together, they will establish an office in Washington, D.C., to generate user/NASA agreements and participation through a three-phase approach:

- \* Outreach: Viable U.S. companies will be shown that the use and application of aeronautics and space technology in their firms could lead to more efficient and effective day-to-day operations and increased productivity.

\* Assistance: Boeing and Peat Marwick will provide the technical and business services necessary to help commercial users prepare proposals acceptable to NASA.

\* Closure: The Boeing team will act as an intermediary, familiar with the needs and procedures of both the firm and NASA, to bring about a final NASA/user understanding.

Boeing is committed to being a major user of the Space Station and has entered into an agreement with NASA calling for the firm to fly a series of microgravity experiments aboard the Space Shuttle. These experiments will involve the growth in space of crystals which promise to prove valuable in the production of semiconductor materials.

Both NASA and Boeing consider the proposed Space Station critical to the U.S. commercial space effort. The Space Station, expected to be placed in Earth orbit in the early 1990s, will contain laboratory and research facilities for commercial endeavors.

- end -

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# NASA News

National Aeronautics and  
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Debra J. Rahn  
Headquarters, Washington, D.C.  
(Phone: 202/453-2754)

**For Release:**

September 9, 1986

## NOTE TO EDITORS:

The first conference on control/structures interaction technology for large, flexible spacecraft, sponsored by NASA and the Department of Defense (DOD), will be held November 18-21, 1986, in Norfolk, Va., at the Omni International Hotel.

Program topics will include: Control of flexible structures program progress; large space structures technology review; selected DOD program reviews; and NASA control/structures interaction research topics.

For more information on the conference, write or call:

Robert L. Wright, NASA Langley Research Center  
Mail Stop 356, Hampton, Va. 23665-5225  
(Phone: 804/865-4990)

-end-



# NASA News

National Aeronautics and  
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Debra J. Rahn  
Headquarters, Washington, D.C.  
(Phone: 202/453-2754)

**For Release:**

September 9, 1986

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For more information on the conference, write or call:

Robert L. Wright, NASA Langley Research Center  
Mail Stop 356, Hampton, Va. 23665-5225  
(Phone: 804/865-4990)

-end-

# NASA News

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Mark Hess  
Headquarters, Washington, D.C.  
(Phone: 202/453-1192)

**For Release:**  
September 9, 1986

RELEASE: 86-129

## SPACE STATION OFFICE FORMS OPERATIONS TASK FORCE

Associate Administrator for the Office of Space Station, Andrew J. Stofan, announced today the formation of an operations task force to review options and recommend concepts for managing and conducting operations aboard the permanently manned Space Station.

Carl B. Shelley, manager of the Customer Integration Office, Johnson Space Center, Houston, Texas, and Dr. Peter T. Lyman, assistant laboratory director, Office of Telecommunications and Data Acquisition, Jet Propulsion Laboratory, Pasadena, Calif., will serve as co-chairmen of the operations task force.

"The Space Station will consist of both unmanned platforms and a manned base," Stofan said. "With Shelley and Lyman as co-chairmen of the task force, we can capitalize on their vast knowledge of manned and unmanned spaceflight operations from long careers working at the NASA centers that are preeminent in the two modes of spaceflight."

At President Reagan's direction, NASA is developing a Space Station which will serve as a permanent facility in space for the conduct of scientific, technology and commercial activities.

International space agencies currently are participating in the preliminary design of the Station and may contribute elements to it as well.

The focus of the task force will be to explore alternative approaches to operating and managing the deployed Space Station, which must integrate a diverse set of U.S. and international hardware elements and accommodate a wide range of manned and unmanned user activities and to recommend an effective concept for operating the system. The task force will report its results and recommendations for operations planning and implementation to the Associate Administrator for Space Station.

About 25 people will serve on the task force full-time. Additional people will serve part-time as consultants or in other special capacities. Members will represent NASA centers, the private sector, the academic community and other governmental agencies with experience and interest in space operations. NASA has invited the international partners to contribute to the U.S. task force activities on any similar operational assessments conducted in parallel.

The task force will begin its work in the next few weeks and is expected to remain active for approximately 4 to 6 months. The task force will conduct its work in Washington, D.C.

- end -

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
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Dwayne C. Brown  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

**For Release:**  
September 10, 1986

RELEASE: 86-130

## EXTERNAL RELATIONS ASSOCIATE ADMINISTRATORS NAMED

Astronaut Frederick H. Hauck has been appointed Acting Associate Administrator for External Relations of the National Aeronautics and Space Administration and Kenneth S. Pedersen has been appointed his deputy.

A Navy Captain, Hauck was selected as an astronaut candidate by NASA in January 1978. He was commander of STS-51A and pilot for STS-7. He also was a member of the support crew for STS-1 and re-entry capsule communicator on the support crew of STS-2.

Hauck succeeds Thomas P. DeCair, who has been appointed Special Assistant to the Associate Administrator for Policy.

Pedersen's appointment will become effective in mid-October upon his return from Georgetown University where he has been detailed since October 1985. Pedersen has been serving as research professor at the Institute for the Study of Diplomacy and teaching at the School of Foreign Service.

In the position of Associate Administrator, Hauck will work in the areas of policy level management, direction and coordination of the Agency's relationships with public and private organizations, both domestic and international. This includes the news media, other federal agencies, state and local governments, foreign governments, international agencies, industry and private individuals.

Pedersen joined NASA in 1979 as Director, International Affairs Division and was assigned to the position of Assistant Associate Administrator for External Relations in 1985.

-more-

Before coming to NASA, Pedersen held several key managerial positions at various government agencies.

Both Hauck and Pedersen were born in Long Beach, Calif., both are married and have two children.

-end-

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For Release:

September 11, 1986

Jim Elliott  
Goddard Space Flight Center, Greenbelt, Md.  
(Phone: 301/286-6256)

RELEASE NO: 86-132

## NONSTOP GLOBAL VOYAGER AIRPLANE TO CARRY EMERGENCY LOCATER

The around-the-world flight of the Rutan Voyager airplane, a 25,000 mile, 12-day, non-stop, unrefueled mission, can count on assistance from an international search and rescue system -- COSPAS/SARSAT -- if it runs into problems. The Voyager will carry an emergency international search and rescue beacon similar to the ones which have saved more than 600 lives over the past 4 years.

Four satellites -- three from the Soviet Union and one from the United States -- can pick up "emergency" signals from downed aircraft or ships at sea and relay the information to rescue forces.

A lightweight prototype personal locator beacon will be provided to the airplane's crew by NASA's Goddard Space Flight Center, Greenbelt, Md. The 1-1/2 pound, waterproof beacon is powered by five 9-volt alkaline batteries, according to Fred Flatow, mission manager for the search and rescue project at Goddard.

The Voyager aircraft, designed by aeronautical engineer Burt Rutan, will be piloted by his 45-year-old brother, Dick, and 32-year-old Jeana Yeager. The pair will take off from Edwards Air Force Base, Calif., on Sept. 15 and fly westward via Australia and Africa. They will be confined in a cockpit only 39-1/2 inches wide and 33 inches deep.

The Voyager has a wingspan of 111 feet, about the same as a Boeing 727 jet. It weighs only 1,838 pounds, but with its crew and 1,400 gallons of fuel, takeoff weight will be approximately 11,300 lbs.

The prototype transmitter, built by Telonics, of Mesa, Ariz., will transmit on frequencies of 406 and 121.5 Mhz, according to Morton L. Friedman, the project's systems engineer. The 406-Mhz frequency signal would be used primarily to determine the location of a transmitted distress signal. The 121.5 Mhz signal would be used by rescue forces to "home in" on the beacon.

Friedman says tests of the prototype transmitter, of which there are only two, indicate the beacon could operate for up to 23 days. He said tests indicated the prototype provided an extremely good signal which would permit ground stations to pinpoint its location very accurately.

COSPAS/SARSAT, an acronym meaning, in general, search and rescue satellite aided tracking, is a cooperative program between Canada, France, the Soviet Union and the United States. Other nations participating in the program include Bulgaria, Denmark, Finland, Norway, Sweden and the United Kingdom. Brazil is expected to join in the near future and other nations have expressed an interest in COSPAS/SARSAT.

Should the Voyager encounter an emergency and the crew were to activate the emergency transponder, its signal would be relayed via satellite to a ground station. In the event the satellite is not within range of a ground station, the signal would be recorded for later transmission to one of the eleven ground stations around the world.

Four stations are located in the U.S. at Scott Air Force Base, Ill.; Kodiak, Alaska; Pt. Reyes, Calif.; and the Goddard Space Flight Center. Three stations are in the Soviet Union at Archangel, Moscow and Vladivostok. Other stations are located at Toulouse, France; Lasham, England; Ottawa, Canada; and Tromso, Norway.

Since the program began in September 1982, 606 lives have been saved in 251 different emergencies worldwide, according to Flatow. Of the rescues, 259 have been maritime saves; 326 have been air and 21 have been terrestrial, such as hikers and campers.

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# NASA News

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For Release:

Leon Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

September 18, 1986

Pete Waller  
Ames Research Center, Mountain View, Calif.  
(Phone: 415/694-5091)

RELEASE: 86-134

## NASA U-2 AIRCRAFT WILL STUDY CONTROLLED CALIFORNIA FOREST FIRE

Scientists at NASA's Ames Research Center, Mountain View, Calif., simultaneously will use remote sensing and ground survey to study a controlled forest fire in California's San Gabriel mountains.

The fire will be ignited by the U.S. Forest Service and Los Angeles County Fire Dept. in 1,000 acres adjacent to San Dimas, Calif. Two periods, Sept. 15 - Oct. 6 and Nov. 16 - Dec. 12, have been established for the burn.

The data will answer questions about the global effects of fire on atmospheric quality, air and water pollution, erosion, soil depletion and species extinction. Scientists will learn more about the effects of fire on different biogenic gases, such as nitrogen oxide and methane hydrocarbons, and how changes in these gases affect the atmosphere and, ultimately, the climate and biosphere.

A controlled burn is an intentionally set fire that burns a prepared area of dead and live vegetation for the purposes of allowing researchers to study the nature of fire -- its movement, intensity, behavior and its effects on the land, water and the atmosphere.

Controlled burns are routinely planned by the Forest Service as a resource management mechanism for studying fire. For the first time, however, NASA will be involved in the simultaneous collection of data by remote sensing and ground survey.

- more -



NASA scientists Jim Brass and Vince Ambrosia, from the Ames Life Sciences Division, will monitor the downlink system which will receive black and white digital images from the U-2 aircraft flying overhead at 60,000 feet. The one-channel information can be relayed in real time onto a video display screen from the U-2 and be printed immediately into hard copy.

The simultaneous data transfer can help the Forest Service monitor and manage fires more effectively. Brass and Ambrosia primarily will concern themselves with collecting ground and aircraft data that will help researchers study the "biogeochemical" effects of fire. They will monitor pathways and changes in nutrient movement and examine the effects of airborne particulates in atmospheric chemistry as a result of fire.

Explaining NASA's involvement in the study, Ambrosia said, "NASA has participated previously in a controlled burn study in October, 1984, when the C-130 was used to 'fly' the burn and collect scanner imagery, but, to date, this is the first time scientists will be involved in an intensive ground collection of fire behavior data." Dr. Joel Levine, NASA's Langley Research Center, Hampton, Va., also will send researchers to the site to collect data concerning atmospheric changes and impacts due to fire.

Approximately 15 agencies will participate in the study including the U.S. Environmental Protection Agency, the California Air Resources Board, the Los Angeles County Fire Dept. and Dept. of Public Works. The U.S. Forest Service will provide most of the resources for the \$750,000 study.

The fire will be started by a Los Angeles County Fire Dept. helicopter which will drop a "jelly-like" gasoline from a "helicopter" and ignite the 1,000 acre area. The torch will be lit by an electronically triggered spark about 20 to 30 feet above the ground. The prescribed burn area will be ringed by a firelane ditch about the width of a 2-lane road.

The brush was cut in part of the area so that the effects of fuel from dead brush could be compared to fuel from live brush. About 300-400 firefighters located in the Los Angeles area will be on hand as extra precaution, although it is highly unlikely that the fire will break beyond the bulldozed area.

The combination of remote sensing and ground survey before, during and following the prescribed burn is expected to help scientists understand the nature of fire and its future impact on our environment.

# NASA News

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For Release:

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Headquarters, Washington, D.C.  
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September 19, 1986

RELEASE: 86-135

## NASA TO TRANSCRIBE MISSION 51-L PRELAUNCH TAPE

NASA is preparing a transcript of a tape recorded at the Kennedy Space Center (KSC) of prelaunch intercom communications among the 51-L crew members. Subsequently, the transcript will be reviewed by the General Counsel, NASA Headquarters, Washington, D.C.

The recording, which began at about the time of crew ingress, contains approximately one hour of crew procedures and personal comments. The tape also records communication on other channels between crewmembers and launch control personnel. The recording is very garbled with some crewmembers "talking over" conversations occurring simultaneously between launch control team members and crewmembers.

Recordings of conversations on ten "primary" KSC launch control channels were transcribed and furnished along with other relevant data to the Presidential Commission in support of the investigation into the cause of the 51-L accident. These transcripts were released to the public. There are recordings of communications on an additional 152 KSC "loops" that have not been released because they do not contain information pertinent to the accident inquiry.

There are a total of 56 communications channels recorded at the Johnson Space Center (JSC). Of these, NASA has released transcripts of the Flight Director and Space Shuttle Program Office loops and the Air-to-Ground channels because they contained data relevant to the investigation into the cause of the accident.

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The recording of the prelaunch crew intercom loop was not transcribed and released previously because it provided no information pertinent to either the cause of the accident or the cause and time of crew death. Historically, NASA has not released transcripts of intercom communications recorded after launch and during a mission, considering that the intercom channel provides a private mechanism for exchanging spontaneous comments and recording information of a personal nature. However, due to media inquiries regarding the intercom conversations, the prelaunch tape is being transcribed.

The transcript in preparation, together with those already released, contain all words spoken by the crew and recorded on NASA loops or intercom systems from the time the crew entered the Challenger on launch morning until the moment of the accident.

-end-

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For Release:

Debra J. Rahn  
Headquarters, Washington, D.C.  
(Phone: 202/453-2754)

September 26, 1986

Linda Ellis  
Lewis Research Center, Cleveland, Ohio  
(Phone: 216/433-2900)

RELEASE: 86-136

## NASA LEWIS AWARDS SUPERSONIC PROPULSION TECHNOLOGY CONTRACT

NASA Lewis Research Center, Cleveland, Ohio, has awarded a \$6.6 million contract to General Electric Co., Cincinnati, Ohio, for definition, modification and test of propulsion systems for supersonic short takeoff and vertical landing technology development.

The contract includes design and modification of a GE F-110 engine, currently used in several contemporary military aircraft. Work will focus on a fan air collection and valving system that will take compressed air from the engine and redirect the air to vertical lift producing devices tested at Lewis Research Center.

The contract is part of the supersonic short takeoff and vertical landing technology program which will support the development of the next century's military aircraft. This program is a joint activity being conducted by NASA and the Defense Advanced Research Projects Agency.

The competitive, cost-reimbursable contract will begin October 1986 and continue for 4 years. Work will be performed at the contractor's plant in Evandale, Ohio, and at NASA's Lewis Research Center.

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For Release:

Sarah Keegan  
Headquarters, Washington, D.C.  
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September 30, 1986

RELEASE NO: 86-137

## NASA RELEASES 51-L PRELAUNCH INTERCOM TAPE TRANSCRIPTS

NASA today released a transcript of the prelaunch intercom communications among the Space Shuttle mission 51-L crewmembers which began just prior to the time of crew ingress on Jan. 28 and contains crew comments during the final phases of the countdown. The transcript contains conversations among crewmembers but only one "side" of communications exchanged between the crew and launch control team members.

The transcript ends at 2 minutes and 5 seconds prior to launch. From this point the recording contains exactly the same words as transcripts previously released. Transcripts have now been released containing all words spoken by the crew and recorded on NASA loops or intercom systems from the time the crew entered the Challenger on launch morning until the moment of the accident.

NASA personnel have reviewed in detail the prelaunch recording and transcript and have found nothing of any significance to the mission or the ensuing accident; the tape and transcript contain routine communications and casual banter.

Dashes or lines in the transcript denote portions of the tape which are unintelligible. The recording is very garbled with some crewmembers "talking over" conversations occurring simultaneously between launch control team members and crewmembers.

Copies of the prelaunch transcript and a list of acronyms are available from the NASA Headquarters newsroom and the JSC newsroom.

- end -

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# NASA News

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David W. Garrett  
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**For Release:**  
October 2, 1986  
12:00 p.m. EDT

Doug Ward  
Johnson Space Center, Houston, Texas  
(Phone: 713/483-5111)

RELEASE NO: 86-138

MOORE REASSIGNED, COHEN NAMED JSC DIRECTOR

Dr. James C. Fletcher, NASA Administrator, today announced that Jesse W. Moore, Director of the Lyndon B. Johnson Space Center (JSC), Houston, will be reassigned in response to his request.

Also announced was the appointment of Aaron Cohen to succeed Moore as JSC director. Cohen is currently director of research and engineering at JSC.

Moore will be reassigned as special assistant to the General Manager, NASA Headquarters, effective Oct. 12, 1986. It is anticipated that Moore will subsequently apply for a Senior Executive Service sabbatical.

"NASA and the country owe special thanks to Jesse, who held two very difficult jobs during the days following the Challenger accident -- that of Associate Administrator for Space Flight and director of JSC. His skills and experience will be well utilized in whatever new assignment he ultimately undertakes," Dr. Fletcher said. Upon completion of the sabbatical, Moore is expected to be assigned to a key position within the Agency.

Moore came to NASA Headquarters in 1978 as Deputy Director of the Solar Terrestrial Division, Office of Space Science. In June 1979, he was appointed Director of the Space Flight Division. In Dec. 1981, he assumed the position of Director, Earth and Planetary Exploration Division. He was appointed Deputy Associate Administrator for Space Flight in 1983. He served as Acting Associate Administrator for Space Flight from April 1984 until he was appointed Associate Administrator on Aug. 1, 1984. While at NASA Headquarters Moore was awarded the NASA Exceptional Service Medal, the NASA Outstanding Leadership Medal and the Presidential rank of meritorious executive. He was named the JSC Center Director on Jan. 23, 1986.

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In prior assignments, Moore was employed at NASA's Jet Propulsion Laboratory, Pasadena, Calif., starting in 1966 and worked in a variety of areas. His last assignment was Science and Mission Design Manager for Project Galileo.

"Aaron Cohen has had a distinguished career in NASA which makes him especially fit for his new post as director of the center that supervises the Space Shuttle program," Dr. Fletcher said. "From 1972 to 1982 he served as the Space Shuttle Orbiter project manager. Perhaps no person in the country knows more about this unique vehicle than Aaron. He has earned the trust and admiration of his associates for his keen mind and exceptional management skills."

JSC is NASA's prime center for manned space flight activities. It is the focal point for development of manned spacecraft and space systems, and the training center for the astronaut corps. Manned missions are planned at JSC and controlled from JSC's mission control center.

Cohen came to NASA in 1962 in the Apollo Spacecraft Program Office at the Manned Spacecraft Center (now the Johnson Space Center). From 1970 to 1972, he served as Manager for the Command and Service Module (CSM), Apollo Spacecraft Program.

From 1972 to 1982, Cohen was Manager of the Space Shuttle Orbiter Project. In this assignment, he was responsible for directing the design, development, production and test flights of the Space Shuttle orbiter.

From 1982-1983, he was Director of the Engineering and Development Directorate with responsibilities for providing engineering development and test support for manned space flight programs assigned to the Johnson Space Center, such as the Space Shuttle and other advanced spacecraft.

In his present position, Cohen is responsible for the overall direction and management of all engineering and space and life science research and development in support of the major manned space flight programs assigned to JSC.

Cohen holds a bachelor of science degree in mechanical engineering from Texas A&M University (1952) and a master of science degree in applied mathematics from Stevens Institute of Technology (1958). He also has completed advanced graduate studies in mathematical physics at New York University and University of California at Los Angeles and was awarded an honorary doctor of engineering in 1982 from the Stevens Institute of Technology.

Cohen has received numerous NASA awards including two distinguished service medals and NASA Engineer of the Year (1982). He was honored with the Presidential rank of meritorious executive in 1981 and the Presidential rank of distinguished executive in 1982.

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LBA

**For Release:**

October 3, 1986

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Franklin O'Donnell  
Jet Propulsion Laboratory, Pasadena, Calif.  
(Phone: 818/354-5011)

RELEASE: 86-140

## NEW SPACE ASTRONOMY TECHNIQUE DEVELOPED TO STUDY CELESTIAL BODIES

A new space radio-astronomy technique, using an orbiting satellite to study celestial objects, has been successfully tested by scientists at NASA'S Jet Propulsion Laboratory, Pasadena, Calif.

An international team of scientists conducted experiments during July and August employing a new space technique called very long baseline interferometry (VLBI). They combined data from radio telescopes on the ground with data from an antenna on NASA's Tracking and Data Relay Satellite System (TDRSS) spacecraft, managed by NASA's Goddard Space Flight Center, Greenbelt, Md.

Investigators obtained better resolution of three quasars than is possible in ground-based radio studies at the same wavelength. Quasars, or quasi-stellar objects, are among the most distant objects known. The resolution obtained from the orbiting VLBI experiment was equivalent to that of a radio telescope with a size of 1.4 Earth diameters. The quasars studied are designated 1730-130, 1741-038 and 1510-089.

For the first time, a VLBI experiment used an orbiting satellite as one of its radio telescopes. Previously, scientists linked widely separated antennae on the ground with VLBI techniques to produce high-resolution radio astronomy studies of celestial objects.

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Primary ground observatories in the experiment were NASA's Deep Space Network 210-foot antenna in Australia and the Institute of Space and Astronautical Sciences' 64-meter antenna at Usuda, Japan. An 80-foot antenna at the Radio Research Laboratory in Kashima, Japan, also was used to check performance of the larger ground antenna.

Researchers believe the experiment's success demonstrates the feasibility of a proposed orbiting VLBI mission. That mission would use a satellite dedicated to radio-astronomy observations and would yield new data on many celestial phenomena, including the nature of galactic nuclei, the overall distance scale of the Universe and the formation of new stars.

The research team led by Gerald S. Levy and other JPL scientists included investigators from M.I.T; the Haystack Observatory, Westford, Mass.; Bendix Field Engineering Corp., Columbia, Md.; the Spacecom/TRW/Bendix team, White Sands, N.M. and NASA's Goddard Space Flight Center, Greenbelt, Md.

Australian participants were from the Commonwealth Scientific and Industrial Research Organization and Australian National University's Mount Stromlo Observatory. Japanese experimenters were from the Institute of Space and Astronautical Science, the Nobeyama Radio Observatory and the Radio Research Laboratory.

NASA's portion of the VLBI experiment was jointly sponsored by the Office of Space Tracking and Data Systems and Office of Space Science and Applications.

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Sarah Keegan  
Headquarters, Washington, D.C.  
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For Release:  
October 3, 1986

RELEASE NO: 86-141

## NASA ANNOUNCES PLANS FOR DISPOSITION OF CHALLENGER DEBRIS

NASA today announced that recovered Challenger debris will be put into long-term storage at Cape Canaveral Air Force Station (CCAFS), Fla. In preparation for the storage, the U.S. Air Force has transferred to NASA the deactivated Minuteman facilities at Complex 31 and 32 on CCAFS.

The Minuteman facilities, which were deactivated in the early 1970s, include two below-ground launch tubes that were used in early testing of the Minuteman ICBM system. These silos contain about 31,000 cubic feet of storage space. Included in the transfer to NASA will be several equipment rooms and a launch control block house.

Required facility modifications will take place in the fall of 1986 and installation of the debris will begin in early 1987. After debris installation, large concrete covers will be placed over the tubes to provide a weather-tight seal that will protect the stored debris.

NASA considered specific requirements while evaluating potential storage sites. Sites were sought that were near NASA's Kennedy Space Center (KSC), Fla., to minimize transportation requirements; that required only minor modifications to keep costs down; and that provided a sheltered environment to prevent weather damage to the debris.

Other options considered included construction of a special building or underground facilities and utilization of the Vehicle Assembly Building (VAB) at KSC or of various silos. The CCAFS facilities were selected because they are close to KSC and present few handling problems, provide adequate volume to store the approximately 215,000 pounds of debris and are currently available.

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The storage of the Challenger debris will conclude NASA's primary activities related to the analysis and disposition of recovered hardware. Where selected components require continued testing, the hardware will be transferred to the storage facility at the conclusion of its test programs.

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For Release:

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October 9, 1986

RELEASE: 86-143

## NASA AND FAA LAUNCH WIND SHEAR RESEARCH PROJECT

The National Aeronautics and Space Administration and the Federal Aviation Administration have signed a memorandum of agreement calling for a joint 5-year, \$24 million research project to develop technology for airborne wind-shear detection and avoidance.

The most dangerous type of wind shear, the microburst, is a small intense downdraft which, upon striking the ground, spreads out into a circular vortex radiating in all directions. When encountered at low levels on approach or takeoff, the pilot usually has little time to react correctly to maintain the desired flight path or even react enough to survive. Between 1964 and 1985, there were at least 26 accidents and 3 incidents involving 626 fatalities and 235 injuries where wind shear was the direct cause or a contributing factor.

The NASA/FAA research project will cover five major areas: technology assessment, present position sensor integration, hazard characterization, pilot factors in wind shear and effects of heavy rain. This represents a consensus approach among the aviation community.

Researchers will thoroughly assess the application of technologies such as doppler and laser radar for airborne equipment to detect the wind-shear danger with the intent of avoiding it. They also will look at the current "reactive" systems that tell a pilot he is in wind shear and offer the crew guidance information to facilitate a safe exit from wind shear.

Another goal is to develop a better understanding of the complex wind structure of a microburst and to define the performance loss of the aircraft from suddenly reduced headwinds combined with the loss of performance from the downward flow of air. Crew training requirements and procedures also will be addressed.

- more -

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Historically, pilots have gained knowledge of hazardous weather conditions through actual flight experiences. Modern, high-technology flight simulations have the capability to model precise aircraft flight characteristics and wind shear and can provide emergency experiences in a completely safe environment, thereby ensuring that pilots react properly when they encounter these problems.

Additionally, researchers will investigate a number of questions on the effects of heavy rain, which usually accompany microbursts, on aircraft performance.

The results of the joint research program will be made available to the aviation industry for use in the development, manufacture and application of airborne wind-shear detection and avoidance systems.

- end -

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For Release:

Leon Perry  
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(Phone: 202/453-1548)

October 14, 1986

Jim Elliott  
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(Phone: 301/286-6256)

RELEASE: 86-144

## RESCUE SATELLITE SAVES FOUR IN FIRST DAY OF OPERATION

Only 6 days after launch and less than 24 hours after being put into operation, the Search and Rescue Satellite Aided Tracking equipment (SARSAT) on board the NOAA-10 satellite, picked up the first distress signal from a downed aircraft leading to the rescue of four Canadians who crashed in a remote area of Ontario.

The RCA-built spacecraft was launched Sept. 17 from Vandenberg Air Force Base, Calif., by a General Dynamics/U.S. Air Force Atlas E launch vehicle. The Canadian/French-built search and rescue equipment on board the NOAA-10 satellite was activated on Sept. 22, according to officials at NASA's Goddard Space Flight Center, Greenbelt, Md., where the SARSAT program is managed.

Details of the rescue were verified by Goddard officials whose engineers are performing final checks on satellite equipment prior to turning over NOAA-10 control to the National Oceanic and Atmospheric Administration.

The SARSAT equipment permits the satellite to pick up distress signals from aircraft or ships and to relay these signals to ground processing facilities which then dispatch rescue forces.

The equipment was activated at 7:40 p.m. EDT during its 76th orbit of the Earth. The next day at 7:28 p.m., during the 90th revolution, SARSAT "heard" a distress signal over Canada and relayed it to Canadian rescue forces in Trenton. The signal was the first indication that someone was in trouble.

- more -

A Soviet satellite - also equipped with search and rescue equipment - verified the distress signal coming from the Ontario area. The NOAA-10 picked up the emergency signal again on its next orbit.

The combination of reports from the American and Soviet satellites and from the pilot of a private plane, caused Canadian officials to alert rescue units in Edmonton, Alberta, which dispatched a four-engine C-130 Hercules with paramedics on board.

Poor weather that evening prevented the C-130 crew from spotting the downed aircraft. However, the rescue crew returned the next morning, when the fog lifted, and parachuted two medical technicians into the area to provide first aid.

Because of the accuracy of the satellite's coordinates, the C-130 crew picked up the Cessna's distress signal at the exact location indicated by the satellite system. The distress signals are sent by an emergency locator transmitter designed to activate automatically upon aircraft impact.

The pilot of the downed aircraft, Rory Johnston, reported losing power on takeoff, forcing him to try an emergency landing on a lake. The plane crashed and sank nose down in about 6 to 8 feet of water. Johnston, suffering from facial cuts, a badly bruised shoulder and a dislocated wrist, swam 200 yards to shore, where he found a canoe, paddled out to his sunken craft and brought his injured passengers ashore. After receiving first aid, all four were flown to an airstrip at Sachigo Lake, transferred to another aircraft and taken to Winnipeg, Manitoba, where they were hospitalized.

The search and rescue program, known as COSPAS/SARSAT, is an international cooperative program in which the major partners are Canada, France, the Soviet Union and the United States. The U.S. currently has two SARSAT satellites in operation while the Soviets have three. Since the program's inception in 1982, the satellites have contributed to saving more than 600 lives.

- end -

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# NASA News

National Aeronautics and  
Space Administration

Washington, D.C. 20546  
AC 202-453-8400

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Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

For Release:  
October 16, 1986

Ed Medal  
Marshall Space Flight Center, Huntsville, Ala.  
(Phone: 205/544-6537)

RELEASE: 86-146

## NASA TO CONSTRUCT SECOND SRM TEST STAND

NASA today announced that it will proceed with the construction of a second horizontal test stand for redesign and recertification of the Space Shuttle Solid Rocket Motor (SRM) at the Morton Thiokol, Inc. (MTI), Wasatch facility in Utah. The foundation of the test stand will be financed and owned by MTI, but the removable test equipment completing the test stand will be owned by NASA and will be available for use at another site after the SRM redesign and recertification process.

The new test stand will be designed to simulate, more closely than the existing SRM test stand, the stresses on the SRM during an actual Shuttle launch and ascent. In addition, the second test stand will provide the capability for additional testing prior to resumption of Shuttle flight and redundancy in the event of a contingency with the existing stand.

The decision to construct a new test stand was made in conjunction with the selection of the horizontal attitude for SRM full-scale testing, and was supported by the National Research Council (NRC) panel overseeing the SRM redesign in its second interim report to the NASA Administrator.

- end -

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

For Release:  
October 17, 1986

RELEASE: 86-147

## NASA SCANNER PRODUCES COMPLETE IMAGE OF NORTH ATLANTIC OCEAN

Using NASA's coastal zone color scanner on the Nimbus-7 satellite, scientists recently completed a computer-generated color image showing, for the first time, the distribution of microscopic plant life, or phytoplankton, in the surface waters of the entire north Atlantic Ocean.

The image also shows the land vegetation index for the continents bordering the north Atlantic basin, making the image the first to show measurements of both land and ocean plant abundance on such a large scale.

Scientists from numerous international institutions participated in the coastal scanner research project. A major conclusion of the study is that data collection on a global scale is essential to understanding the role of man and other biosphere components in the carbon dioxide and other important global cycles.

Photosynthesis by land and ocean plants converts carbon dioxide into plant tissue and is a vital natural process that removes carbon dioxide from the atmosphere and oceans.

The scanner measured sunlight reflected from the sea surface at five wavelengths to determine ocean color. Data was transmitted to receiving stations at various locations around the Earth.

The most striking feature in the image is the "spring bloom", the region of high phytoplankton concentration extending across the Atlantic and into the North Sea. This image is the first time that the spring bloom was observed as a coherent feature extending across the entire north Atlantic Ocean.

Using computers, scientists at NASA's Goddard Space Flight Center, Greenbelt, Md., then solved complicated equations which converted raw scanner measurements into the amount of phytoplankton chlorophyll in the water. Chlorophyll is the pigment that gives plants the capability to photosynthesize.

Launched aboard the Nimbus-7 satellite in October 1978, the scanner acquired data along a swath approximately 500 miles wide during a single pass of the satellite. Although the scanner was designed to collect measurements primarily over coastal waters, the image of the north Atlantic Ocean was generated by merging many individual orbits of scanner data to form a composite image representing average conditions in May.

The land vegetation index was acquired from observations by the satellite sensor called the advanced very high resolution radiometer onboard the NOAA-6 satellite, launched in June, 1979. Dark green in the image represents high density vegetation. The Sahara Desert, tropical rainforests of South America and the spring greening of north American forests and fields are features of interest.

The scanner provided data from its 1978 launch until the summer of 1986 when the scanner went silent. NASA and NOAA are reviewing options to replace the scanner with an ocean color imager for use by the early 1990s. Beyond that, NASA plans advanced satellite sensors to collect measurements over land, oceans and atmosphere in conjunction with the agency's role in the Earth System Science initiative. One sensor program is the Earth observing system proposed for the polar platform of the Space Station.

- end -

A photograph to illustrate this news release will be distributed without charge to media representatives. Photographs may be obtained by calling (202/453-8383) or writing to:

Broadcast and Audio/Visual Branch, LFD-8  
NASA Headquarters, Washington, D.C., 20546

Photograph: 86-HC-258

# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

Dave Garrett  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

For Release:  
October 20, 1986  
11:00 a.m. EDT

RELEASE: 86-149

## MYERS BECOMES NASA DEPUTY ADMINISTRATOR

Dr. Dale D. Myers today became deputy administrator of the National Aeronautics and Space Administration. Myers succeeds Dr. William R. Graham who is leaving NASA to become director of the White House Office of Science And Technology Policy.

Myers was sworn in by Vice-President George Bush in a ceremony held in the Vice-President's office.

Most recently, Myers served as an at-large member to the NASA Advisory Council, an organization created to provide advice and counsel to NASA top management on aeronautics and space programs. From 1979-1984, he served as president and chief operating officer, Jacobs Engineering Group, Inc., Pasadena, Calif.

Myers served as undersecretary, U.S. Department of Energy from 1977-1979. From 1974-1977 he was vice president, Rockwell International and president, North American Aircraft, El Segundo, Calif. He was the associate administrator for Manned Space Flight, NASA from 1970-1974. From 1969-1970 Myers served as vice president/program manager, Space Shuttle Program, Rockwell International. He was vice president and program manager, Apollo Command/Service Module Program, North American-Rockwell from 1964-1969.

Myers was born in Kansas City, Mo., on January 8, 1922. He graduated from the University of Washington, Seattle, in 1943 with a B.S. degree in Aeronautical Engineering and received an honorary doctorate from Whitworth College in 1970.

Myers is married to the former Marjorie Williams of Seattle. They have two children.

- end -

# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

Sarah Keegan  
Headquarters, Washington D.C.  
(Phone: 202/453-8536)

For Release:  
October 21, 1986  
10:00 a.m. EDT

John Lawrence  
Johnson Space Center, Houston, Texas  
(Phone: 713/483-5111)

RELEASE: 86-151

## SENIOR STAFF CHANGES MADE AT JOHNSON SPACE CENTER

Changes in several senior staff positions at NASA's Johnson Space Center, Houston, were announced today by Dr. Aaron Cohen, center director. The new assignments are effective immediately.

Robert C. Goetz becomes technical assistant to the center director. He will assist with a number of projects of importance to JSC, including strategic planning activities. Goetz was formerly deputy center director and was reassigned at his own request.

Clifford E. Charlesworth will serve as special assistant to the director. He has been with NASA since 1962 and has held several key positions, most recently as director of Space Operations.

Henry O. Pohl becomes director, Engineering. He has been associated with propulsion systems development since 1957. He came to JSC's Propulsion and Power Division in 1962 as a senior propulsion engineer and has held a number of key supervisory positions in that organization. He has served as division chief since 1980.

William R. Kelly will serve as director, Administration. He came to JSC in 1962 as a senior engineer in the Mercury Project Office. He has held a number of management positions within the center, most recently as director of Center Support.

Dr. R. Wayne Young will report to Kelly as deputy director, Administration. He joined JSC in 1962 as a technical manager in the Apollo Spacecraft Project Office and also has held a number of key managerial positions.

Astronaut Paul J. Weitz is temporarily assigned as technical assistant to the center director. He served as pilot on the first manned Skylab mission in 1973 and in 1983 he commanded the sixth Space Shuttle mission. He has been an astronaut since 1966 and most recently was assigned as deputy chief of the Astronaut Office.

- end -

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
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For Release:

Mark Hess  
Headquarters, Washington, D.C. October 21, 1986  
(Phone: 202/453-1192) 3:30 p.m. EDT

RELEASE NO: 86-152

## MOSER TO HEAD SPACE STATION PROGRAM OFFICE

NASA Administrator James C. Fletcher today named Thomas L. Moser to become director of the Space Station Program Office which will be located in the Washington, D.C., area.

The Space Station Program Office will be responsible for the overall technical direction and content of the Space Station program, including systems engineering and analysis, configuration management and the integration of all elements into an operating system that is responsive to customer needs. Moser will report directly to Andrew J. Stofan, Associate Administrator for Space Station.

Establishment of the program office in Washington was in response to a recommendation by a committee headed by former Apollo Program Director Gen. Samuel E. Phillips (USAF-Ret.) which is conducting a long-range assessment of overall NASA capabilities and requirements. Dr. Fletcher announced this past summer that program management of the Space Station would be centralized in Washington to improve communications, program control and accountability.

Moser was appointed Deputy Associate Administrator for Space Flight at NASA Headquarters in February 1986. Prior to this position, he was director of Engineering at the Johnson Space Center, Houston.

Moser began his career with NASA in 1963 as a mechanical systems design and analysis engineer. From 1966 to 1971 he was the structural subsystem manager for the Apollo command module and subsequently became project manager for the Shuttle Structures and Mechanics Division. In 1972, Moser was named head of structural design and manager for Orbiter structure and thermal protection system.

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He became technical assistant to the director in 1981 and was named deputy manager, Orbiter Project Office in 1982. He assumed the position of director of Engineering in 1983.

Born Aug. 12, 1938, in Houston, Moser received a B.S. degree in mechanical engineering from the University of Texas in 1961 and an M.S. degree in mechanical engineering from the University of Pennsylvania in 1963. He has completed candidacy requirements for a Ph.D. at Rice University.

Moser has received numerous NASA awards, including the Exceptional Engineering Medal and two Special Achievement Awards. He belongs to two professional engineering fraternities and is a member of the American Institute for Aeronautics and Astronautics and the National Management Association. He is a registered engineer in the state of Texas.

Moser and his wife, the former Nelwyn DeLaney, reside in Arlington, Va. They have two children, Matthew and Meredith.

-end-

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
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For Release:

Dave Garrett  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

October 23, 1986

RELEASE: 86-154

## SUTTER NAMED NASA ADVISORY PANEL CHAIRMAN

Dr. James C. Fletcher, NASA Administrator, today announced the appointment of Joseph F. Sutter to be the new chairman of the NASA Aerospace Safety Advisory Panel. The panel is a senior advisory group to the NASA Administrator.

Sutter, former Executive Vice President of the Boeing Commercial Airplane Company and now an aerospace consultant, succeeds John C. Brizendine.

Sutter's career spanned 41 years with The Boeing Company after he joined them in 1945 as an aerodynamicist. One of the pre-eminent commercial aircraft designers today, he has received a large number of awards for his guiding role in the development of jet-powered airliners that brought aviation to full maturity during his career. He will receive the Wright Memorial Trophy in ceremonies in Washington, D.C. on Dec. 12, 1986.

In recognition of his technical abilities, Sutter was appointed on February 6, 1986, to the President's Commission on the Space Shuttle Challenger Accident. On this commission, he was team leader for the development and production panel.

Sutter and his wife, Nancy, reside in Seattle, Wash. They have three grown children and five grandchildren.

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# NASA News

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Azeezaly S. Jaffer  
Headquarters, Washington, D.C.  
(Phone: 202/453-1922)

For Release:

October 28, 1986

RELEASE: 86-155

## NASA SELECTS SMALL BUSINESS RESEARCH PROPOSALS

NASA announced today the selection of 172 research proposals for immediate Phase I award negotiations in their 1986 Small Business Innovation Research Program. Included are 144 small, high technology firms located in 31 states and territories.

SBIR objectives are to stimulate technological innovation in the private sector, strengthen the role of small business participation (including minority and disadvantaged firms) in federal research and development programs and contribute to the growth and strength of the private sector.

These SBIR Phase I awards were selected competitively on the basis of scientific and technical merit and value to NASA from 1628 proposals received in response to the SBIR solicitation which closed on June 30, 1986. This is the 4th year of Phase I selections made by NASA in accordance with Public Law 97-219, the Small Business Innovation Development Act of 1982.

Phase I projects are 6-month, fixed-price contract efforts to establish the feasibility of innovative research concepts. Projects showing greatest promise are eligible to compete for Phase II follow-on contracts of up to 2-years duration to continue development. Approximately one-half the Phase I projects may be selected for Phase II. Work beyond Phase II would be funded either by commercial firms or by specific government programs outside SBIR funding.

As required by law, NASA allocates 1.25 percent of its annual R&D budget for all Phase I and Phase II SBIR procurements, which are conducted by 9 NASA Field Centers. Approximately \$8.5 million of NASA's 1987 SBIR allocation will be used for this Phase I procurement. The program is managed by NASA's Office of Commercial Programs, NASA Headquarters, Washington, D.C.

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(Editors Note: A listing of the selected companies and their locations is available in the NASA Headquarters newsroom, Room 6043, 400 Maryland Ave., S.W., Washington, D.C. Phone: 202/453-8400.)

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# NASA News

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AC 202-453-8400

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For Release:

Debra J. Rahn  
Headquarters, Washington, D.C.  
(Phone: 202/453-2759)

October 31, 1986

Linda Ellis  
Lewis Research Center, Cleveland, Ohio  
(Phone: 216/433-2900)

RELEASE: 86-156

## NASA AWARDS CONTRACTS FOR DESIGNING ADVANCED POWER SYSTEM

The NASA Lewis Research Center, Cleveland, Ohio, has awarded parallel contracts to design an advanced power system which holds promise for providing highly efficient, long-life and reliable dynamic power systems for future terrestrial applications. This work also may have applications to NASA's research on future space power systems.

The design will include a free-piston Stirling engine, a liquid metal heat pipe receiver, and a means to provide power to a utility grid.

Contracts were awarded to Mechanical Technical, Inc., Latham, N.Y. (\$253,385) and Stirling Technology Co., Richland, Wash. (\$246,576).

Research on the Advanced Stirling Conversion System is funded by the Department of Energy (DOE) Solar Thermal Technology Program. NASA's Lewis Research Center, with substantial background and expertise in Stirling engines, is providing technical management, and Sandia National Laboratories, Albuquerque, New Mexico, is managing the program.

The free-piston, external combustion Stirling engine has only two moving parts and works by heating and cooling air or a gas enclosed in a cylinder. At one end of the cylinder, a heat source, such as focused solar energy, heats the air or gas inside the cylinder. As the gas is heated, it expands and pushes the piston. Electric power to the utility grid is derived from the engine either directly, using a linear alternator, or indirectly by use of a hydraulic output to a ground-based fluid pump coupled to a generator. The conceptual designs will have the potential of meeting DOE's long-term performance and cost goals.

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# NASA News

National Aeronautics and  
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For Release:

Debra J. Rahn  
Headquarters, Washington, D.C.  
(Phone: 202/453-2754)

October 31, 1986

Carter Dove  
Goddard Space Flight Center, Greenbelt, Md.  
(Phone: 301/286-5566)

RELEASE: 86-157

## NASA TO EXTEND SPACECRAFT TRACKING STATION OPERATIONS

NASA's Goddard Space Flight Center, Greenbelt, Md., has announced plans to extend operations at five of its ground tracking stations until at least September, 1988.

The ground tracking stations planned for extended operational status are at Ascension Island in the southeast Atlantic Ocean; Santiago, Chile; Guam; Hawaii; and the Yarragadee Shuttle air-to-ground voice station located in western Australia.

The five stations are part of a network which relays commands to and receives data from near Earth-orbiting spacecraft, including the Space Shuttle.

The planned five station closure is conditional on the February, 1988 launch by the Space Shuttle of the second Tracking and Data Relay Satellite (TDRS) and subsequent placement of TDRS into geosynchronous Earth orbit.

A third TDRS is scheduled for launch in September 1988 as a backup to either of the two operational TDRS's.

NASA changed its original network streamlining plans, calling for station closings to start on July 1, 1986, because of the loss of a TDRS in the 1986 Space Shuttle Challenger accident.

A sixth ground station at Dakar, Senegal, (W. Africa), has been placed in caretaker status until resumption of Space Shuttle flights. Upon completion of the Tracking and Data Relay Satellite System constellation of three TDRS's planned for mid 1989, the Dakar station also will be closed.

- more -

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The TDRSS, owned by the Spacecom Division of Contel and managed by the Goddard Space Flight Center, will be comprised of two operational and one spare TDRS on orbit, providing more than 85 percent coverage of a spacecraft's orbit, compared with 50 percent coverage now provided by existing ground stations and the first TDRS, launched in April 1983.

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For Release:

Debra Rahn  
Headquarters, Washington, D.C.  
(Phone: 202/453-2754)

Embargoed Until  
November 7, 1986

Donald G. James  
Ames Research Center, Mountain View, Calif.  
(Phone: 415/694-5091)

RELEASE: 86-158

## NASA DEDICATES NEW RESEARCH LABORATORY

NASA's Ames Research Center, Mountain View, Calif., officially dedicated its newest research facility today, the Fluid Mechanics Laboratory.

Ames scientists and engineers anticipate that this facility will stimulate breakthroughs in basic knowledge of aerodynamic flows. Important technological applications, ranging from developing fuel-efficient aircraft to low-speed research on the National Aero-Space Plane, will be addressed in the new lab.

"The unique feature is that this new laboratory can support multiple, simultaneous small-scale wind tunnel research with full access to supercomputer resources for thorough analyses of theory and experiment", says Dr. Sanford Davis, chief, fluid dynamics branch.

A significant portion of the lab will be devoted to vortex flows. A major factor in the development of enhanced vehicle maneuverability and reduced drag by aerodynamic means is the use of effective vortex control devices. The key to control is the use of emerging computational tools for predicting viscous fluid flow in close coordination with fundamental experiments. In fact, these extremely complex flow fields require an intimate relationship between computation and experiment. Examples of current research in this area will be shown in the lab.

Researchers will be able to conduct experiments, get nearly real-time theoretical feedback and be able to alter the experiment to test a variety of configurations or test environments.

- more -

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The \$2.35 million, 21,336 sq. ft. facility houses small-scale wind tunnels for advanced experimental and computational research in fluid mechanics and will serve as a national focal point for government/industry/university cooperation. The wind tunnels will be supported with the most advanced optical and electronic instrumentation. The FML also will serve as a center for advanced computer/experiment integration by taking advantage of Ames' extensive computational resources.

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# NASA News

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For Release:

Sarah Keegan  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

November 5, 1986  
2:00 p.m. EST

RELEASE NO: 86-159

## NASA ANNOUNCES NEW SPACE SHUTTLE MANAGEMENT STRUCTURE

Dale D. Myers, NASA Deputy Administrator, today announced the new management and operations structure for the National Space Transportation System (NSTS) -- or Space Shuttle -- program. Myers said the changes were being made to clarify the focal points of authority and responsibility in the Shuttle program and to establish clear lines of communication in the information-transfer and decision-making processes.

Myers was joined at a press conference by Rear Admiral Richard H. Truly, Associate Administrator for Space Flight; Arnold D. Aldrich, currently Manager, NSTS, at the Johnson Space Center (JSC), Houston; and astronaut Robert L. Crippen.

A crucial part of NASA's strategy to return the Shuttle safely to flight has been to strengthen the NSTS program management structure and operation. This action was directed by Truly in a March 1986 memo. It was later addressed by the U.S. House of Representatives Committee on Science and Technology, which investigated the Challenger accident, and by the Presidential Commission on the Space Shuttle Challenger Accident in its recommendations to review the Shuttle management structure (Recommendation II) and to improve program communications (Recommendation V).

Aldrich was named to the position of Director, NSTS, in Washington, D.C., with full responsibility and authority for the operation and conduct of the NSTS program. This will include total program control with full responsibility for budget, schedule and balancing program content. The Director will report directly to the Associate Administrator for Space Flight and will have two deputies, one for Program and one for Operations.

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Aldrich has been associated with the U.S. manned space program almost since its inception, joining the NASA Space Task Group, the forerunner of NASA's Manned Spacecraft Center (later JSC), in 1959 after graduation from Northeastern University. From 1966 to 1975, he held increasingly responsible positions in the Apollo program. In 1975, he joined the Space Shuttle program office where he managed various aspects of the program until his appointment as overall NSTS Program Manager in 1985.

Richard H. Kohrs, currently Deputy Manager, NSTS, at JSC, was appointed to the position of Deputy Director, NSTS Program, responsible for the day-to-day management and execution of the Shuttle program. This will include detailed program planning, direction, scheduling and STS systems configuration management. Other responsibilities will encompass systems engineering and integration for the STS vehicle, ground facilities and cargos. The Deputy Director, NSTS Program, will be located at JSC, but will report directly to the Director, NSTS.

Kohrs, a graduate of Washington University, spent six years with McDonnell Corp. before joining the Manned Spacecraft Center in 1963. He worked on the Apollo program in several areas until 1973 when he became the manager of technical integration for the Space Shuttle. In 1980, he became responsible for overall Shuttle systems integration and in 1983, he was named Deputy NSTS program manager.

Robert L. Crippen was named to the position of Deputy Director, NSTS Operations, reporting directly to the Director, NSTS, and responsible for all operational aspects of STS missions. This will include such functions as final vehicle preparation, mission execution and return of the vehicle for processing for its next flight. In addition, the Deputy Director, NSTS Operations, will present the Flight Readiness Review (FRR), which will be conducted by the Associate Administrator for Space Flight; manage the final launch decision process; and chair the Mission Management Team (MMT).

Crippen, a native Texan and a graduate of the University of Texas, became a NASA astronaut in 1969. He was in the astronaut support crew for the Skylab 2,3 and 4 missions as well as the Apollo-Soyuz Test Project. Crippen has the distinction of having flown on a record four Shuttle missions, having served as pilot on the first Shuttle flight in April 1981 and commanding three subsequent missions in June 1983 and April and October 1984.

In addition, it was announced that William R. Marshall, Manager, Shuttle Projects Office, at the Marshall Space Flight Center, Huntsville, Ala., will report directly to the Deputy Director, NSTS Program.

Upon the announcement of the new Shuttle management and operations structure, Truly said, "In my view, the formation of this program management organization is one of the most positive steps NASA has taken in the last several months to strengthen the Shuttle program and return to flight status. The individuals named to these new posts undoubtedly will play a major role in preserving our nation's pre-eminence in space."

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For Release:

Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

November 24, 1986

James Doyle  
Jet Propulsion Laboratory, Pasadena, Calif.  
(Phone: 818/354-5011)

RELEASE: 86-160

## NASA STUDY SUGGESTS TETONIC MOTION CAUSED DESERT TO MOVE

A recently completed study by NASA's Jet Propulsion Laboratory, Pasadena, Calif., (JPL) suggests that periodic, violent earthquakes along the San Andreas Fault, millions of years ago, rotated the northwest Mojave Desert about 25 degrees clockwise.

According to JPL Geologist, Dr. Matthew Golombek, "results of magnetic studies of volcanic rocks taken from 19 sites suggested the movement was caused by shear from the Pacific Plate sliding along the fault past the North American Plate in a northwesterly direction. (Shear is the force that causes parallel planes, such as the Earth's tectonic plates, to slide past or over one another).

Golombek, who conducted the study this past summer with Dr. Laurie Brown of the University of Massachusetts said the tectonic motion occurred in a series of violent earthquakes over millions of years. More than 100 core samples were taken from the 20-million-year-old Saddleback Basalt and 56 samples were taken from the Red Buttes Quartz Basalt around Boron and Kramer Junction, he said.

"We believe the rotation occurred between 20 million and 16 million years ago. Magnetic minerals line up parallel to the Earth's magnetic field to the north. Because the magnetic minerals in the rocks are now pointing about 25 degrees to the east of the north magnetic pole, we could determine that tectonic movement rotated the rocks," Golombek said.

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-2-

"From the period of 16 million years ago to the present, there is no indication of rotation. Clockwise rotation of the northwest Mojave agrees in direction with the bending of the southern Sierra Nevada Mountains due to shear from the tectonic motion along the San Andreas Fault. The rotation occurred before the formation, about 10 million years ago, of the Garlock Fault which separates the Mojave from the Tehachapi Mountains and runs in a northeast-southwest line," the NASA scientist concluded.

The study was made for the Geodynamics Branch of NASA's Earth Science and Applications Division, NASA Headquarters.

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Barbara Selby  
Headquarters, Washington, D.C.  
(Phone 202/453-8536)

**For Release:**  
November 26, 1986  
12 Noon EST

Leon Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

Terry Eddleman  
Marshall Space Flight Center, Huntsville, Ala.  
(Phone: 205/544-6535)

RELEASE: 86-161

## UPPER STAGE SELECTED FOR PLANETARY MISSIONS

NASA has selected the Inertial Upper Stage (IUS), a launch vehicle which fits in the cargo bay of the Space Shuttle as the baseline option to carry probes to Jupiter, Venus and the sun. However, an option is being kept open until early next year to fly one of these missions on a Titan IV.

NASA Administrator James C. Fletcher selected the upper stage, built by the Boeing Aerospace Co. under Air Force contract, for three planetary missions -- Galileo, Magellan and Ulysses -- to be launched in 1989 and 1990. These missions will be the first to employ an IUS to carry payloads to study other bodies in the solar system.

Each of the planetary payloads will use a standard two-stage IUS, with the exception of Ulysses -- a probe to study the poles of the sun -- which will require the addition of a Payload Assist Module, built by McDonnell Douglas Astronautics Co. The added module, a smaller "kick" stage, will be needed for additional energy to reach proper orbit around the sun.

Ulysses is a joint mission of NASA and the European Space Agency (ESA). ESA funded and built the Ulysses spacecraft which will have on board several American scientific instruments.

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The IUS is a two-stage, 17-foot-long vehicle weighing more than 16 tons. It has already been employed to carry payloads to geostationary orbit -- where satellites match the turning of the Earth and appear unmoving in the sky -- although it has always been designed for both Earth-orbital and planetary missions.

The Magellan mission will orbit Venus and map its surface with radar, since the cloud cover of the planet obscures direct vision.

Galileo will orbit Jupiter for nearly 2 years to measure such things as electromagnetic fields and plasma particles. The orbiting spacecraft also will send down an atmospheric probe for on-site readings, although the probe is expected to last for no more than a few hours because of the intense atmospheric pressure. Galileo is a joint mission of NASA and Germany, which developed the retropropulsion system for the probe's descent into the Jovian atmosphere.

The study of the solar poles by Ulysses will be the first time in the history of the space program for such an area to be investigated.

The Magellan, Galileo and Ulysses missions are managed by NASA's Jet Propulsion Laboratory, Pasadena, Calif. The IUS and payload-to-IUS integration for the planetary missions will be managed for NASA missions by the agency's Marshall Space Flight Center, Huntsville, Ala.

In August a Commerce Business Daily announcement gave notice of a proposed NASA action to study alternative launch vehicles for planetary missions following cancellation of the Shuttle/Centaur Upper Stage. Because of an urgent and compelling need to reestablish NASA's planetary program following the Challenger accident, the space agency concluded that IUS had the unique capability to meet the mission requirements.

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

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David Garrett  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

For Release:

November 28, 1986

John B. Taylor  
Marshall Space Flight Center, Huntsville, Ala.  
(Phone: 205/544-0031)

RELEASE: 86-163

## NASA AWARDS CONTRACT FOR PROBLEM AND SAFETY ASSESSMENT CENTERS

NASA's Marshall Space Flight Center, Huntsville, Ala., has selected Calspan Corp., Buffalo, N.Y., for award of a contract for operation of the Marshall Problem Assessment Center and Safety Issue Assessment Center.

Calspan will receive problem reports and safety issues from the prime contractors of Marshall's numerous projects, check the accuracy and completeness of the reports and track the closeout of proposed corrective actions. The company also will perform trend analyses and special studies to identify generic causes of problems and safety issues, and apprise Marshall management on a daily basis about its findings. Marshall will make the final assessments and take appropriate corrective action from the data presented.

Calspan will provide the management, personnel, equipment and supplies to provide mission services for these assessment centers, both of which will be located at Marshall under its Safety, Reliability and Quality Assurance Office.

The contract, to run for a period of 5 years beginning Jan. 1, 1987, has a negotiated price of approximately \$8.9 million.

Other firms who submitted proposals were Rockwell International, Inc., Downey, Calif.; Lockheed Missiles and Space Co., Inc., Huntsville; Otha C. Jean and Associates, Huntsville; and USBI Booster Production Co., Inc., Huntsville.

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# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
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Barbara Selby  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

**For Release:**

November 28, 1986

John B. Taylor  
Marshall Space Flight Center, Huntsville, Ala.  
(Phone: 205/544-0031)

RELEASE: 86-164

## PERSONNEL CHANGES ANNOUNCED AT MARSHALL SPACE FLIGHT CENTER

Four key appointments in the Science and Engineering Directorate have been announced by J. R. Thompson, Director of the George C. Marshall Space Flight Center, Huntsville, Ala. The new positions are being created as part of a realignment of functions within the Directorate. These changes become effective December 1.

Dr. Judson A. Lovingood is named associate director for Propulsion Systems, responsible for assuring engineering adequacy of the Center's propulsion projects including the Space Shuttle Main Engine, Solid Rocket Booster, External Tank, Orbital Maneuvering Vehicle and upper stages. Dr. Lovingood has served as associate director for Engineering, Science and Engineering Directorate since May 1986. He previously served as manager, Main Engine Project and deputy manager, Shuttle Projects Office.

E. Ray Tanner is appointed associate director for Space Systems, responsible for assuring engineering adequacy of the Space Station, Hubble Space Telescope, Advanced X-Ray Astrophysics Facility, Marshall Center-assigned payloads and Spacelab payload integration. Tanner has served as deputy manager, Spacelab Program Office since August 1983 and was previously assigned to the Science and Engineering Directorate as chief engineer for the Spacelab Program.

John P. McCarty is named director, Propulsion Laboratory, responsible for research and development, engineering and technical direction of propulsion systems design and analysis related to launch and space vehicles.

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McCarty has served as director of the Structures and Propulsion Laboratory, Science and Engineering Directorate, since October 1986. He previously served as deputy director of that laboratory as well as chief of its Propulsion Division.

Dr. George F. McDonough is named director, Structures and Dynamics Laboratory, responsible for research and development in structural design and analysis of launch and space vehicles, analysis dynamics behavior, specification of dynamics-related design criteria and analysis of atmospheric and environmental processes.

Dr. McDonough has been the director of the Systems Dynamics Laboratory, Science and Engineering Directorate, since March 1981 and previously served as deputy associate director for Engineering, Science and Engineering and deputy director of the former Data Systems Laboratory.

According to Thompson, the planned organizational adjustments will strengthen the Center's position to meet the agency's goal of getting the Space Shuttle back into operation in 1988. "It also will prepare the Center for its substantial role in the Space Station program as well as other important projects both assigned and anticipated," he said.

With the realignment, the chief engineer function will be divided between the associate director for Propulsion Systems and the associate director for Space Systems, as appropriate, to permit more focus on these areas.

The Propulsion Laboratory will combine all dedicated propulsion activities, including the relocation of the Propulsion Test Division from the Test Laboratory. The Structures and Dynamics Laboratory will focus these activities in one major organization.

According to Thompson, the Information and Electronics Systems, Materials and Processes and the Space Science Laboratories are not affected. The Systems Analysis and Integration Laboratory structure will remain the same. However, there will be adjustments associated with the propulsion and thermal disciplines within the laboratory.

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Barbara Selby  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

For Release:

November 28, 1986

George Diller  
Kennedy Space Center, Fla.  
(Phone: 305/867-2468)

Mary Ann Peto  
Lewis Research Center, Cleveland, Ohio  
(Phone: 216/433-2902)

RELEASE: 86-165

## SIXTH FLTSATCOM TO BE LAUNCHED

The sixth FLTSATCOM communications satellite is scheduled for launch by NASA from Cape Canaveral Air Force Station, Fla., on Dec. 4, 1986. Liftoff from Complex 36 is planned to occur at the opening of a launch window that extends from 9:04 p.m. to 12:02 a.m. EST. The Department of Defense (DOD) satellite, FLTSATCOM-G (designated FLTSATCOM F-7 in orbit), will provide service to DOD users over the continental United States, as well as establishing a test bed for future military communications systems.

FLTSATCOM F-7 will be placed in a geostationary orbit above the equator where it will provide 2-way communications, in the 240- to 400-MHz frequency band, between any two points on Earth visible from its orbital location. The spacecraft has a design life of 5 years.

The FLTSATCOM program is managed by the Naval Space and Warfare Systems Command. The Air Force Space Division, Los Angeles, is responsible for production, launch vehicle/spacecraft integration and tracking and data acquisition.

The FLTSATCOM satellites are the spaceborne portion of a worldwide DOD network to enable communications between naval aircraft, ships, submarines, ground stations, Strategic Air Command elements and presidential command networks.

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The satellite system will provide 23 ultra high frequency communication channels and one super high frequency channel. The FLTSATCOM F-7 satellite also will carry an experimental Extra High Frequency (EHF) package.

This will be the 66th launch of an Atlas Centaur, NASA's standard launch vehicle for intermediate-weight payloads. The first Atlas Centaur was launched May 8, 1962.

NASA is reimbursed for all costs of the Atlas Centaur and launch services by the DOD under provisions of a launch services agreement.

The Atlas Centaur (AC-66) launch vehicle will place FLTSATCOM F-7 into a highly elliptical orbit of 90 by 19,324 nautical miles (nm.) After reorientation of the satellite, a solid propellant rocket motor aboard the spacecraft will be fired to circularize the orbit at a synchronous altitude of 19,324 nm. At that altitude, because the speed of the spacecraft in orbit matches the rotational speed of the Earth, the satellite remains in position over one spot on the equator.

NASA's Lewis Research Center, Cleveland, has management responsibility for the Atlas Centaur development and operation. Kennedy Space Center is assigned vehicle checkout and launch responsibility once the vehicle reaches Cape Canaveral.

The FLTSATCOM satellites, built in Redondo Beach, Calif., by the Defense and Space Systems Group of TRW, Inc., are 22 feet tall and weighs 5,061 pounds at liftoff and 2,488 lb. after apogee motor firing.

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For Release:

Barbara Selby  
Headquarters, Washington, D.C.  
(Phone: 202/453-8536)

December 2, 1986

John Lawrence  
Johnson Space Center, Houston, Texas  
(Phone: 713/483-5111)

RELEASE: 86-166

## ASTRONAUT JOE ENGLE RETIRES

Astronaut Joe H. Engle has retired from active duty as a colonel with the U.S. Air Force and resigned from the NASA astronaut corps effective Nov. 30.

Engle became an astronaut in April 1966. He was commander of the second flight of Shuttle Columbia in November 1981. He also commanded orbiter Enterprise on its second and fourth approach and landing tests and commanded orbiter Discovery mission 51-I in August-September 1985. The latter mission deployed three communications satellites and rendezvoused with and repaired and redeployed a failed on-orbit satellite. Engle was Deputy Associate Administrator for Office of Space Flight, NASA Headquarters, from March to December 1982.

Engle will remain in the Houston area. A native of Kansas, he has been appointed by the Governor of Kansas and the Secretary of the Air Force as an advisor to the Kansas Air National Guard. He also will be active in aerospace consulting work and will be associated with sporting and wildlife interests.

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# NASA News

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For Release:

Barbara Selby  
Headquarters, Washington, D.C. December 3, 1986  
(Phone: 202/453-8536) 4:00 P.M. EST

RELEASE NO: 86-167

## NASA SELECTS PAYLOAD GROUND OPERATIONS CONTRACTOR

NASA today announced the selection of McDonnell Douglas Astronautics Co., Kennedy Space Center, Fla., for negotiations leading to the award of a contract to perform Payload Ground Operations at Kennedy, including KSC activities at Cape Canaveral Air Force Station, Fla.; Vandenberg Air Force Base, Calif.; Space Transportation System landing sites and work locations in or outside the United States.

The PGOC is a consolidation of work presently being performed under contracts with McDonnell Douglas, Boeing Aerospace, Computer Science Corp., EG&G Florida and Planning Research Corp.

The cost-plus-award-fee contract will have an initial period of 3 years, plus a single price option for an additional 3 years. Ultimately, follow-on awards could result in a total contract period of 15 years. McDonnell Douglas' proposed cost for the first 6 years is approximately \$327 million. The contract will be managed by Kennedy Space Center.

The purpose of the PGOC is to obtain a single, long-term contract for payload processing activities. The contractor will perform the activities necessary for payload/cargo processing and integration; Spacelab operations and integration; support to experiment integration activities; payload/cargo deintegration; NASA/Vandenberg payload operations; payload related facilities, systems and ground equipment operations; maintenance and sustaining engineering; customer accommodation and launch-site support functions; and payload related support operations and services.

The other proposer was Boeing Aerospace Operations, Cocoa Beach, Fla.

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# NASA News

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Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

For Release:

December 8, 1986

RELEASE NO: 86-168

## FOUR GREAT OBSERVATORIES WILL AID IN ASTRONOMICAL EXPLORATIONS

Almost everyone is curious about the universe. Although mankind has studied astronomy since ancient times, many aspects of the universe remain mysterious. Our understanding of the universe no longer depends on preconceptions but on precise observations and measurements. The advance of spaceflight has made possible the placing of sensitive astronomical instruments into space.

We now have the advanced technology needed to place entire observatories into space for investigations across the spectrum and thereby open a new era of space observations.

Astronomical observations pose some of the greatest challenges of modern technology. During the past two decades, NASA has continued to develop and place into orbit, increasingly sensitive instruments to observe the universe with improved sensitivity. With the development of the four great observatories, we now have technology for the future.

A new generation of space observatories offer new gains of sensitivity through state-of-the-art technology:

### - Gamma Ray Observatory -

The Gamma Ray Observatory (GRO) will explore the most energetic part of the spectrum across a much greater wavelength range than earlier observatories. The GRO will enable us to determine if most of the known gamma radiation arriving from the universe originates in quasars and pulsars, or whether there are other sources of gamma ray emission.

### - Advanced X-Ray Astrophysics Facility -

The Advanced X-Ray Astrophysics Facility (AXAF) will cover the x-ray portion of the spectrum with a 1000-fold improvement in sensitivity. AXAF will be an international observatory for studying highly energetic environments found in nearly every

- more -

known object in the universe, including stars and planets as well as neutron stars, black holes, quasars and cores of active galaxies. With AXAF, the most distant quasars in the universe will be located and studied.

- Space Infrared Telescope Facility -

The Space Infrared Telescope Facility (SIRTF) will span the infrared part of the spectrum with a 1000-fold increase in sensitivity. SIRTF will provide a vital tool needed for detailed studies of the infrared universe. SIRTF will be able to search for planets around the nearest stars. If planets are detected, the Search for Extraterrestrial Intelligence could be more clearly focused.

- Hubble Space Telescope -

The Hubble Space Telescope (HST), the largest telescope ever put into space, will penetrate deep into the universe in visible and ultraviolet light, expanding the volume of observable space by several hundred times more than now possible. Named for Edwin P. Hubble (1889-1953), who discovered that the boundaries of the universe extend far beyond the Milky Way, HST represents a quantum leap in sensitivity, resolution and precision.

HST has a primary mirror 2.4 meters in diameter that is essentially perfect and being operated above the Earth's atmosphere, the telescope's observations will distinguish fine details with 10 times the clarity of the best ground-based observatories. HST's five primary instruments are:

(1) A High Resolution Spectrograph, which will examine the ultraviolet region of the spectrum, seeing light which cannot reach Earth. It will detect objects 1,000 times dimmer than those observed by previous spacecraft at comparable or higher spectral resolution.

(2) The Wide Field/Planetary Camera, designed to observe relatively large fields of view, can operate in two modes. Its "wide field" capability permits the examination of large areas of space, allowing accurate plotting of the location and spatial structure of distant objects such as galaxies and quasars. It also has a high resolution, or "planetary" mode, to permit the study of planets within our solar system as well as the detailed structure of galaxies, nebulae and star clusters.

(3) The Faint Object Spectrograph can obtain spectra of extremely faint astronomical objects in ultraviolet and visible wavelengths allowing scientists to study comets before they are chemically changed by the sun and to analyze quasars thought to be at the nuclei of some galaxies.

(4) The High Speed Photometer is designed to measure the total light and its time variations from an object in space. The instrument will resolve fluctuations in brightness on a time scale down to 10 millionths of a second.

(5) The Faint Object Camera was developed by the European Space Agency. This instrument will have the capacity to measure accurately the intensity of faint galaxies at unprecedented distances into the universe and will see closer objects in greater detail.

HST will be placed in a 370 mile orbit. During its mission, which will extend well into the next decade, the telescope will receive in-orbit servicing by astronauts aboard the Shuttle or from crew members aboard the Space Station. NASA's Marshall Space Flight Center, Huntsville, Ala., will manage the maintenance and refurbishment program. In-orbit operation of the telescope is the responsibility of the Space Telescope Operations Control Center, at NASA's Goddard Space Flight Center, Greenbelt, Md.

The science data from HST will be sent to the Space Telescope Science Institute, located at Johns Hopkins University, Baltimore, Md., for analysis and dissemination to astronomers from around the world who will come to observe the telescope's results.

In this era of the Space Shuttle and Space Station, the new family of permanent observatories in space will make possible the comprehensive study of astrophysics. We will be able to throw open the doors of the universe and look back in time and space for order and meaning.

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Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

For Release:

December 8, 1986

Franklin O'Donnell  
Jet Propulsion Laboratory, Pasadena, Calif.  
(Phone: 818/354-5011)

RELEASE: 86-169

## NASA INSTRUMENT AIDS OCEAN WEATHER MONITORING

An airborne sensing device that could greatly enhance satellites' capability to monitor ocean weather patterns has been developed by researchers at NASA'S Jet Propulsion Laboratory (JPL), Pasadena, Calif.

The new infrared radiometer, used to measure ocean surface temperatures, is 100 times more sensitive than typical radiometers. The new radiometer's ability to distinguish between the temperature of the ocean surface and that of the atmosphere immediately above is considered a major scientific advance. Earlier airborne sensors lacked this ability, making the task of assembling highly accurate climate maps more problematic.

The radiometer was tested in flights over waters between Los Angeles and Southern California's Santa Catalina Island, aboard the Goodyear blimp Columbia. The radiometer is a passive instrument -- as opposed to active instruments such as radar devices that emit signals to monitor weather patterns. The radiometer gauges sea temperatures by analyzing infrared light given off naturally by the ocean surface.

Researchers hope that temperature and wind maps generated by such instruments will help scientists develop better models of highly complex global weather interactions -- for example, how storm systems are generated in the tropics and spread to other latitudes.

Eventually, scientists believe oceanographic research may lead to a better understanding of such phenomena as El Nino, an unusual water warming in the eastern Pacific Ocean that previously has damaged fishing industries.

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The scientific team which developed the infrared radiometer was led by oceanographer Denise Hagan and physicist Crofton Farmer of JPL's Atmospheric and Oceanographic Science Section. The research is funded by NASA's Office of Space Science and Applications.

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For Release:

Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

December 4, 1986

David W. Thomas  
Goddard Space Flight Center, Greenbelt, Md.  
(Phone: 301/286-8956)

RELEASE: 86-170

## REMOTE SENSING WILL HELP PREDICT CHANGES IN SOIL CONDITIONS

Satellites combined with computer technology are throwing a "one-two punch" to better understand the importance of soil within the total ecosystem.

A computer simulation model of the properties and processes in the soil can be combined with satellite data of the Earth's surface to predict changes that occur in soils over a period of time, and also, the ability of the soil to support different types of plant life.

The theory is advanced by Dr. Elissa Levine, a physical scientist at NASA's Goddard Space Flight Center, Greenbelt, Md., during the current annual meeting of the American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, in New Orleans. Her observations are contained in her conference report, "Modeling Soil Processes with the Use of Remote Sensing".

"By combining the soil simulation model and remote sensing (via satellite and aircraft), we can obtain critical environmental data which will help us understand how changes brought about by both nature and humankind will affect the total ecosystem over time," according to Dr. Levine.

By linking surface conditions to processes occurring underground, the soil system makes invaluable contributions to our environment.

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"Characteristics of a given soil determine its ability to perform important functions including supplying nutrients, water and mechanical support for plant growth, recycling organic materials needed to supply nutrients and filtering wastes and pollutants before they reach ground water," she said. Levine and her colleagues say these functions also help to maintain aquatic life and drinking water.

Scientists believe that soils change slowly in response to management or changes in their environment. However, it is difficult to determine the effects of today's environmental activities on soils -- such as acid rain increases in atmospheric carbon dioxide, decrease in atmospheric ozone or agricultural practices -- or how soil helps to offset these activities without extensive experimental sampling in the field.

Levine said that answers concerning the effects and remedies of these and other environmental problems must be obtained quickly. Long-term field experiments would take too long to set up and carry out. She concluded, "The computer-satellite combination provides scientists with a quick and accurate collection of data about the soil and the Earth's surface without depending on field measurements which may be difficult to acquire."

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For Release:

Leon N. Perry  
Headquarters, Washington, D.C.  
(Phone: 202/453-1548)

December 8, 1986

Michael J. Braukus  
Goddard Space Flight Center, Greenbelt, Md.  
(Phone: 301/286-5565)

RELEASE: 86-172

## NASA SCIENTISTS EMPLOY SATELLITES TO MAP THE OCEAN FLOOR

If there were no winds, waves or currents, the world's oceans might appear very calm and flat. However, oceans have their own hills and valleys, similar to those on land, according to Dr. James Marsh, a geophysicist at NASA's Goddard Space Flight Center, Greenbelt, Md.

"Think of ocean surfaces as if they were blankets thrown over rugged terrain. The force of gravity pulls water down into the depressions or forces it up around the mountains, causing gentle hills and valleys on the water's surface," said Dr. Marsh. He added that ocean surfaces are so uneven that looking north from Puerto Rico toward Bermuda, one could see the ocean surface drop nearly 60 feet over a distance of almost 30 miles.

A map generated by Marsh and his co-workers, using data obtained from the altimeters of the Geodynamic Experimental Ocean Satellite (GEOS-3) and the Sea Satellite (SEASAT), shows the true topography of the Earth's ocean surfaces in greater detail and more accurately than ever before. The GEOS-3 and SEASAT measured the distance from space to the ocean surface with radar. The radar-generated data then was used to develop a computer image of the surface of the world's oceans.

Marsh said, "The altimeter data allowed us to measure profiles of the ocean surface. By putting together many profiles, we were able to compute a map of its true shape. The map reflects what the Earth's structure is like under the ocean. If we can understand the underlying crustal structure, it'll give us information on other important phenomena, such as earthquakes and volcanoes."

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He continued, "The data generated by GEOS-3 and SEASAT also increased our knowledge of ocean circulation and current systems. The spacecrafts' altimeters allowed us to detect and study features 1 to 2 meters in height."

Marsh believes the success of these experiments led to the development of the Ocean Topography Experiment satellite (TOPEX/Poseidon), a NASA/CNES (the French Space Agency) joint venture, planned for launch in 1991.

The altimeters on board future oceanographic satellites, such as TOPEX/Poseidon, will be so accurate they will enable scientists to observe most of the world's ocean surface currents.

Marsh concluded, "The ocean is a major means for transporting heat around the Earth. TOPEX/Poseidon will help us study ocean currents and their circulation and how they influence the world's weather patterns."

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David W. Garrett  
Headquarters, Washington, D.C.  
(Phone: 202/453-8400)

For Release:

December 9, 1986

RELEASE: 86-174

## NASA SELECTS SMALL BUSINESS RESEARCH PROPOSALS

NASA announced today the selection of 49 research proposals for immediate negotiation of Phase II contract awards in their Small Business Innovation Research (SBIR) program. Included are 45 small, high technology firms located in 14 states.

The proposals selected were chosen competitively from an initial group of 100 proposals for Phase II continuations of Phase I projects from NASA's 1985 program. The total value of these 49 awards is approximately \$23 million.

SBIR objectives are to stimulate technological innovation in the private sector, strengthen the role of small business participation (including minority and disadvantaged firms) in federal research and development programs and contribute to the growth and strength of the private sector.

SBIR Phase II projects are continuations of the most promising Phase I projects to establish feasibility and value of research innovations undertaken by small, high technology firms. Approximately one half the Phase I projects may be selected for Phase II. Selection also may depend on availability of future funding by the private sector or government for continued development or commercialization beyond the SBIR program scope. Funding for Phase II contracts may be up to \$500 thousand over a period up to 2 years.

Within the next 2 months, a second group of Phase II award selections will be made from a group consisting of the best of the proposals remaining in the initial group plus approximately 30 additional proposals recently received. The total number of Phase II proposals to be selected in these two selection steps is expected to exceed 75, with a total contract value more than \$38 million.

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SBIR projects are procured and conducted by 9 NASA field Centers. Overall program management is by NASA's Office of Commercial Programs, NASA Headquarters, Washington, D.C.

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(Editor's Note: A listing of the selected companies and their locations is available in the NASA Headquarters newsroom, rm. 6043, 400 Maryland Ave., S.W., Washington, D.C.)

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For Release:

Debra J. Rahn  
Headquarters, Washington, D.C.  
(Phone: 202/453-2754)

December 12, 1986

RELEASE: 86-175

## NASA'S TRACKING SATELLITE EXPERIENCES PARTIAL S-BAND FAILURE

NASA announced today the failure of transmit capability on an S-band single-access antenna (SA-1) on the Tracking and Data Relay Satellite (TDRS-1). The malfunction is believed to be in the area of the diplexer. NASA is continuing to perform tests to verify the cause of the failure. Since the remaining single-access antenna (SA-2) is functioning properly and SA-1 can still receive signals, TDRS-1 is able to maintain normal operations with orbital spacecraft.

S-band provides voice and data links between low Earth-orbiting satellites, including the Shuttle.

On November 28, TDRS-1 experienced a loss of transmitted power on the S-band link to user satellites and all services were switched to the other single-access antenna (SA-2) with little or no loss of data to the customers. NASA, TRW and Spacecom have been working to isolate the problem and determined today that the malfunction is most probably in the area of the diplexer. The diplexer is a passive device that isolates the transmitted and received signals for user spacecraft.

TDRS-1 and NASA's ground Space Tracking and Data Network will continue to provide complete tracking support of the near Earth-orbiting spacecraft, including the Space Shuttle until two additional TDRS can be launched. The second TDRS was lost in the 51-L accident. The next TDRS is scheduled to be launched on the February 1988 Space Shuttle mission. The third TDRS is scheduled for launch in September 1988.

TDRS-1 was launched from the Space Shuttle in April 1983 and is now in geosynchronous orbit over the Atlantic Ocean just east of Brazil (41 degrees west longitude).

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The Tracking and Data Relay Satellite System is owned by Contel's Spacecom Division, Gaithersburg, Md. and managed by NASA's Goddard Space Flight Center, Greenbelt, Md.

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RELEASE: 86-176

## NASA PRODUCES MAJOR POWER IMPROVEMENTS WITH JET ENGINE PROGRAM

Need to get a jet fighter up to 40,000 feet thirty seconds faster? That could require developing a new engine with all its attendant costs. However, a new engine control system, developed by NASA, squeezes unused power out of present jet engines to offer major thrust and fuel economy advantages.

Using newly developed engine/flight control integration technology, researchers at NASA's Ames-Dryden Flight Research Facility, Edwards, Calif., have been demonstrating increased thrust of 10 percent or more with its F-15 research aircraft. Flight tests have shown fuel savings exceeding five and up to seven percent in some types of flight. The increased performance has been accomplished with only one of the two F-15 engines modified.

The engine and flight control integration technology necessary for such jumps in performance are a result of NASA's Highly Integrated Digital Electronic Control program (HIDEC). HIDEC trades unneeded engine stall margin for increased performance (stall margin is the amount that engine operating pressure must be reduced to avoid stall). HIDEC is being conducted in conjunction with the Air Force, McDonnell Aircraft Co., and Pratt and Whitney.

Several factors add to the typical 25 percent stall margin required by a jet engine, which often reduces an engine's usable power by almost 15 percent. This is necessary with conventional engines because designers have to allow for the worst combination of flight conditions in which aircraft fly.

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The HIDEDEC system allows the engine to adjust or trim itself to the minimal stall margin in any case. Situations such as inlet flow disturbances, afterburner use and a remaining "insurance pad" or margin are compensated for and adjustments also are made dependent on actual flight conditions rather than being assumed constant.

HIDEDEC drops the stall margin requirement down to about 12 percent, still allowing for variations in engines, control tolerances, air density variations, inlet flow disturbances and a four percent pad.

The key to such performance increases is an engine and flight control system that communicate with each other. The NASA/McDonnell F-15 is equipped with one Pratt & Whitney 1128 research engine with digital electronic engine control and a standard F-100 engine. In addition, the F-15 is modified with a digital electronic flight control system.

The HIDEDEC combines the engine control and flight control systems. Flight condition information such as attitudes, rates and pilot commands are provided to the HIDEDEC and analyzed. In addition, the HIDEDEC system anticipates flight conditions in advance to select the minimum margin required for that instant of flight. The appropriate commands are then made to the digital engine control system which adjusts the engine nozzle to provide the correct operating pressure.

NASA Ames-Dryden project manager Dr. James F. Stewart characterizes HIDEDEC program accomplishments as major and expects HIDEDEC to be found on the fighter aircraft of the 1990's. "The single-engine program has been virtually problem free, very fruitful and the numbers are better than predicted."

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# NASA News

National Aeronautics and  
Space Administration

Washington, D.C. 20546  
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**For Release:**

December 19, 1986

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RELEASE NO: 86-177

NASA 1986: THE YEAR IN REVIEW

The Space Shuttle Challenger accident, the subsequent investigation and the recovery activities were the dominant National Aeronautics and Space Administration events of the year 1986.

However, while the agency concentrated on the resumption of Shuttle flights in early 1988, major accomplishments in other areas were taking place.

Following a spectacular encounter with planet Uranus in January, the Voyager 2 spacecraft continues its scientific journey through the solar system towards an encounter with Neptune in 1989.

A new baseline configuration for the Space Station was adopted and draft requests for proposals were issued to prospective contractors--a major milestone for beginning development next year.

NASA and the Department of Defense initiated the joint National Aero-Space Plane research program. This program will lead to an entirely new family of aerospace vehicles capable of horizontal takeoff and landing, single-stage operations to orbital speeds and sustained hypersonic cruise within the atmosphere using airbreathing propulsion.

Late in the year, NASA and the 3M Company signed an agreement under which the firm will conduct 62 materials processing experiments aboard the Space Shuttle over an extended period.

These topics, including the appointment of NASA Administrator James C. Fletcher, Deputy Administrator Dale D. Myers and other major managerial changes are detailed in this release.

NOTE TO PROGRAM DIRECTORS

Videotape material is available to support a number of topics covered in this release. Contact:

Public Affairs Audio-Visual Office  
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TOPIC	NO.
Gearing Up For 1988	A&SR 242
(Shuttle Recovery Program)	
Space Station	A&SR 241
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#### ADMINISTRATION

Dr. James C. Fletcher became administrator of NASA for the second time on May 12, 1986, succeeding James M. Beggs who had resigned. Dr. William R. Graham was acting administrator when Fletcher assumed office. Fletcher previously served as NASA administrator from April 1971 to May 1977.

The agency was deeply involved in the investigation of the Challenger accident, serving in a research and analysis role for the Presidential investigation commission, when Fletcher assumed office. His statement upon receiving the report of this commission set the tone for his administration:

"Where management is weak, we will strengthen it," he said. "Where engineering or design processes need improving, we will improve it. Where our internal communications are poor, we will see that they get better."

Fletcher immediately sought the opinions and advice of a large number of persons in the agency and out, then initiated a major study of NASA management which has led to fundamental restructuring of two major programs and is expected to lead to important changes in the overall agency management structure.

Working with the National Academy of Public Administration, Fletcher appointed retired Air Force General Samuel C. Phillips, who had headed the Apollo program in 1964, to direct this study. In addition, three separate committees of the National Research Council were organized to provide oversight of Space Shuttle redesign efforts.

In other important activities during the year, the administrator:

Secured Presidential and Congressional support for an orbiter to replace the Challenger.

Secured Presidential and Congressional support to keep Space Station development on track toward its original goal - to achieve a permanent manned presence in space in 1994.

Made a substantial number of changes among the agency's top management personnel, especially in the Space Shuttle and Space Station programs.

Initiated a completed reassessment of Space Station design and assembly procedures which has lead to major changes in this program. He has encouraged continuing negotiations over Space Station issues with international partners.

In the two major program management restructurings, which involved the Space Shuttle and the Space Station, the concept of a "lead center" was abandoned and the highest levels of program management moved to NASA Headquarters. In both cases, focal points of program authority and responsibility were clearly identified and lines of communication and decision-making channels and processes well defined.

The action involving the Space Shuttle program responded to recommendations by the Presidential 51-L accident investigation commission, which had recommended that NASA consider emphasizing centralized authority for programs that involve several NASA centers.

Decisions concerning the agency's overall structure and management were expected to be announced shortly after Jan. 1, 1987. Changes in the Space Shuttle and Space Station programs are compatible with the agencywide adjustments to be announced.

In the area of key personnel, Fletcher appointed new directors for the Kennedy Space Center and the Marshall Space Flight Center, whose directors had retired, and for the Johnson Space Center, whose director was reassigned within the agency. He also appointed a new associate administrator for the Space Station program. These appointments led to numerous additional appointments in key positions in each of the centers and NASA Headquarters, especially in the Space Shuttle and Space Station programs.

In one of the most important moves during the year, Fletcher created the new Office of Safety, Reliability, Maintainability and Quality Assurance, also in response to a recommendation by the Presidential commission, to re-emphasize these areas in the wake of the Challenger accident. It is headed by an associate administrator who reports directly to the administrator.

As the year ended, Fletcher announced to all civil servants and contract employees a new set of goals for the agency, developed by NASA's Strategic Planning Council, which he chairs. He also explained a continuing effort to identify specific objectives to meet the goals. In the document the agency explicitly stated, for the first time in its history, a goal of expanding the human presence beyond the Earth.

The administrator established a group to determine NASA's response to the long-term goals for the U.S. space program recommended by the President's National Commission on Space, and initiated an effort to develop short-term goals to take the agency to 1995. The latter effort is under the direction of Dr. Sally Ride. These activities took place within the context of growing national concern about the health of the American space effort compared to expanding space programs in the Soviet Union, Western Europe, Japan and China.



## SPACE FLIGHT

NASA's launch year for 1986 began on Jan. 12 with the launch of Space Shuttle mission 61-C using the orbiter Columbia. Robert L. "Hoot" Gibson commanded the 6-day flight with Charles F. Bolden Jr. serving as pilot. Mission specialists included George D. "Pinky" Nelson, Steven A. Hawley and Franklin R. Chang-Diaz (the first Hispanic American to journey into space). Also aboard were payload specialists Robert J. Cenker of RCA and U.S. Rep. Bill Nelson of Florida. Payloads on 61-C included RCA's Satcom K-1 communications satellite, successfully deployed; the Materials Science Laboratory; the first Hitchhiker payload-of-opportunity carrier; the Infrared Imaging Experiment; and 13 Getaway Specials. Mission 61-C concluded on Jan. 18 with a landing at Edwards Air Force Base, Calif.

Ten days later on Jan. 28, mission 51-L with commander Francis R. "Dick" Scobee, pilot Michael J. Smith, mission specialists Judith A. Resnik, Ellison Onizuka and Ronald E. McNair, and payload specialists Gregory B. Jarvis of Hughes and Christa McAuliffe, the first teacher in space, was launched from Kennedy Space Center, Fla., at 11:38 a.m. EST. At 73 seconds into the flight, the orbiter Challenger broke up under severe aerodynamic loads, after the leaking right-hand solid rocket motor caused the external tank to fail setting off an explosive burn of propellants which destroyed the external tank. The crew and the vehicle were lost.

Jan. 28 -- Shortly after the accident, a 51-L Interim Mishap Review Board was established to investigate the cause of the mission failure. This group, headed by Jesse Moore, Associate Administrator for Space Flight, NASA Headquarters, consisted of Richard Smith, Director of Kennedy Space Center, Fla.; William Lucas, Director of Marshall Space Flight Center, Huntsville, Ala.; Arnold Aldrich, Manager, National Space Transportation System at Johnson Space Center, Houston; James Harrington, Director, Spacelab, NASA Headquarters; and Walter Williams, NASA consultant to the administrator.

Feb. 3 -- President Reagan announced the formation of the Presidential Commission on the Space Shuttle Challenger Accident, headed by William P. Rogers, former Secretary of State. The commission was directed to (1) review the circumstances surrounding the accident to establish probable cause; and (2) develop recommendations for corrective or other action based upon its findings and determinations.

Feb. 5 -- NASA Acting Administrator William R. Graham established the 51-L Data and Design Analysis Task Force (replacing the Interim Mishap Investigation Board) to support the Presidential commission by analyzing facts, circumstances and design issues surrounding the accident. The Associate Administrator for Space Flight was designated Chairman of the task force.

Feb. 20 -- Rear Admiral Richard H. Truly was appointed Associate Administrator for Space Flight, replacing Jesse W. Moore, who had been named director of Johnson Space Center on Jan. 23. On Feb. 22, Truly named Thomas L. Moser as his deputy.

March 1 -- James R. Thompson, Princeton University, was appointed vice-chairman of the NASA 51-L Data and Design Analysis Task Force.

March 25 -- A Solid Rocket Motor Redesign Team was formed to requalify the motor of the Space Shuttle's solid rocket booster. The group was managed on an interim basis by James E. Kingsbury, director of Marshall's Science and Engineering Directorate.

May 3 -- Delta 178 carrying the Geostationary Operational Environmental Satellite (GOES-G), launched at 6:18 p.m. EDT, from Cape Canaveral Air Force Station, Fla., was destroyed by range safety due to premature main engine shutdown.

May 4 -- An investigation board headed by Lawrence J. Ross, Lewis Research Center, Cleveland, was formed to investigate the Delta 178 flight failure.

May 9 - John W. Thomas, Spacelab Program Office Manager at Marshall Space Flight Center, assumed management responsibility for the Solid Rocket Motor Redesign Team.

June 6 -- The report of the Presidential Commission on the Space Shuttle Challenger Accident was submitted to President Reagan. This report included nine recommendations by the commission to help assure the safe return to flight.

June 11 -- Astronaut Robert L. Crippen was assigned to head a group formed to review overall Space Shuttle program management.

June 19 -- NASA Administrator James C. Fletcher announced the decision to terminate the development of the Centaur Upper Stage for use aboard the Shuttle. This decision was based on the fact that, even following certain modifications identified by ongoing reviews, the resultant stage would not meet safety criteria being applied to other cargo or elements of the Space Shuttle system.

June 25 -- TRW, Inc., was selected by NASA for negotiations leading to the award of a contract to develop the Orbital Maneuvering Vehicle (OMV). A reusable, remotely-operated, propulsive vehicle to increase the range of the Space Transportation System, the OMV will be used primarily for spacecraft delivery, retrieval, boost, deboost and close proximity visual observation beyond the operating range of the Space Shuttle.

July 14 -- NASA's plan to implement the recommendations of the Rogers commission was submitted to President Reagan.

Aug. 5 -- James R. Thompson was named director of Marshall Space Flight Center, replacing Dr. William Lucas, who retired July 1.

Aug. 15 -- President Reagan announced his decision to support a replacement for the Challenger. At the same time, it was announced that NASA no longer would launch commercial satellites, except for those which are Shuttle-unique or have national security or foreign policy implications.

Aug. 18 -- Astronaut Sally Ride was named Special Assistant for Strategic Planning, responsible for reviewing NASA's goals and objectives for near- to long-term planning.

Aug. 20 -- Lt.Gen. Forrest S. McCartney, Commander of the Space Division, Air Force Systems, Los Angeles, was named director of Kennedy Space Center, replacing Richard G. Smith who retired from NASA on July 31.

Aug. 22 -- NASA announced the beginning of a series of tests designed to verify the ignition pressure dynamics of the Space Shuttle solid rocket motor field joint. The series will be conducted over the next year at Morton Thiokol's Wasatch Division in Utah and Marshall Space Flight Center.

Sept. 5 -- Study contracts were awarded to five aerospace firms for conceptual designs of an alternative or Block II Space Shuttle solid rocket motor.

Sept. 5 -- A Delta vehicle carrying a Strategic Defense Initiative payload was launched successfully from Cape Canaveral Air Force Station.

Sept. 10 - Astronaut Bryan O'Connor was named chairman of a new Space Flight Safety Panel. This panel, with oversight responsibility for all NASA manned space program activities, reports to the Associate Administrator for Safety, Reliability, Maintainability and Quality Assurance.

Oct. 2 -- Aaron Cohen was appointed director of Johnson Space Center, replacing Jesse Moore, who left the position to become special assistant to the NASA General Manager at Headquarters. Cohen had been director of research and engineering at Johnson.

Oct. 2 -- After an intensive study, NASA announced the decision to test fire the redesigned solid rocket motor in a horizontal attitude. This test best simulates the critical conditions on the field joint which failed during the 51-L mission.

Oct. 3 -- NASA announced February 1988 as the target date for resuming Shuttle flights. A 3-year projected manifest was released based on a reduced flight rate and accommodating as far as possible the payload backlog.

Oct. 16 -- NASA announced that it would proceed with the construction of a second horizontal test stand for redesign and recertification of the Space Shuttle solid rocket motor at the Morton Thiokol Wasatch facility in Utah. The new test stand will be designed to simulate, more closely than the existing SRM stand, the stresses on the SRM during an actual Shuttle launch and ascent.

Oct. 29 -- The Committee on Science and Technology, U.S. House of Representatives, released its report on the Investigation of the Challenger Accident.

Nov. 5 -- A new management and operations structure for the National Space Transportation System was announced by NASA Deputy Administrator Dale Myers. Arnold D. Aldrich was named director of the National Space Transportation System in Washington, D.C. He had previously been manager of the NSTS in Houston.

Nov. 13 -- A Scout launch vehicle carrying the Polar Beacon Experiments and Auroral Research satellite was launched successfully from Vandenberg Air Force Base, Calif.

Nov. 26 -- NASA announced the selection of the Inertial Upper Stage (IUS), a launch vehicle which fits into the cargo bay of the Shuttle as the baseline option for three planetary missions -- Galileo, Magellan and Ulysses. In addition, the Transfer Orbit Stage (TOS), which also fits in the Shuttle payload bay but has the potential for being integrated with a Titan launch vehicle, was selected to place the Mars Observer spacecraft into the proper interplanetary trajectory. While these missions all are baselined for the Shuttle, an option was kept open until early 1987 to fly one of them on a Titan.

Dec. 4 -- An Atlas-Centaur carrying a FLTSATCOM military communications satellite was launched successfully from Cape Canaveral Air Force Station at 9:30 p.m. EST.

## SPACE STATION

This was a year of progress and transition for the Space Station as NASA laid the organizational and programmatic framework for beginning development during which the final design, construction, launch and initial operation of the permanently manned Space Station will take place.

A new baseline configuration for the Space Station, called the "dual keel," was adopted as the reference configuration to guide the final 8 months of preliminary design activities.

Former Lewis Research Center Director Andrew J. Stofan was named Associate Administrator for Space Station in June and Dr. Franklin D. Martin was subsequently named the deputy associate administrator.

A major review of Space Station program management was conducted by former Apollo Program Director Gen. Samuel Phillips. Based on that review, the NASA Administrator announced in June the decision to locate a Space Station Program Office in the Washington, D.C. area. The program office is responsible for overall technical direction and content of the Space Station. Thomas L. Moser was selected as the Space Station program director.

In July, the NASA administrator directed the Space Station Office to review all aspects of the Space Station program, including design, work package assignments and functions. The review was to address Congressional concerns over the implications of the work packages and examine technical issues involving the Station. Primary among the technical issues was the ability of the Shuttle to support the Space Station assembly sequence and the ability of the crew to support the extensive extravehicular activity (EVA) required for both assembly and maintenance of the Station.

Based on the review, NASA modified the Station baseline configuration including expanding the "resource" nodes used to connect the working and living modules together and established a revised assembly scenario.

Expanding the resource nodes permits flight critical command and control equipment, previously located outside on the Space Station's framework, to be housed inside the nodes. This alleviates the need for crew members to perform EVA for routine maintenance and replacement of these components. The expanded nodes also provide about 4,000 cubic feet of additional pressurized volume to the Space Station.

The revised assembly sequence concentrates on accommodating payload instruments during early assembly missions and on obtaining permanent occupancy as soon as possible to enhance the ability of the Station to generate early scientific return.

Following considerable analysis, NASA field center work package assignments for the various Space Station components were developed and approved by the NASA administrator.

On the international front, program level agreements were reached with Japan, Canada and the European Space Agency (ESA). Japan is conducting preliminary design on an attached multipurpose research and development laboratory including a pressurized module, an exposed work deck, a scientific/equipment airlock, a remote manipulator arm and an experiment logistics module.

Canada is concentrating its preliminary design activities on a mobile servicing center, a multi-purpose system equipped with manipulator arms to help assemble and maintain the Space Station, instruments and experiments.

ESA is conducting preliminary design of a permanently-attached pressurized laboratory module and a polar-orbiting platform. In addition, NASA and ESA agreed to jointly study an ESA man-tended free-flyer (pressurized module and resource module).

The Task Force on Scientific Uses of the Space Station published its second and final summer study report, examining ways the manned Space Station could contribute to scientific research and calling for NASA to generate general guidelines for ensuring the Station's effectiveness as a research facility. The task force will become part of a permanent advisory group under the NASA Advisory Council.

Draft requests for proposals (RFPs) for the Station's development phase were issued to prospective contractors in November, marking a major milestone in the preparations for beginning development next year.

A Technical and Management Information System (TMIS) RFP was issued in July. The TMIS is a computer-based system that will support the technical and management functions of the overall Space Station program.

A Software Support Environment (SSE) RFP was issued also. The SSE will provide "the environment" that will be used for all computer software developed for the Space Station program.

A Space Station Operations Task Force was formed in September to recommend optional concepts for managing and conducting operations aboard the manned base and the platforms.

## SPACE SCIENCE AND APPLICATIONS

The temporary loss of U.S. space launch capability precluded what was to have been "A Year For Space Science." Five major scientific mission launches were planned for 1986, including Spartan Halley, Astro-1 and three planetary mission--Galileo, Ulysses and the Hubble Space Telescope. However, NASA science and applications continued working a variety of activities not requiring launches.

The Space and Earth Science Advisory Committee (SESAC), of the NASA Advisory Council, issued an in-depth report on the status of space science within NASA. The 2-year study entitled "The Crisis in Space and Earth Science, A Time for A New Commitment," called for greater attention and higher priority for science programs.

### Solar System/Planetary Science

The most notable science achievement during 1986 was the successful encounter with planet Uranus by the Voyager 2 spacecraft in January. The Uranus encounter provided prime scientific data on a planetary body never before examined by a space probe at such close range. The 9-year-old robotic spacecraft, Voyager 2, is continuing its scientific journey through the solar system towards an encounter with planet Neptune in 1989.

The Galileo mission to Jupiter, a joint project with the Federal Republic of Germany, was planned to make a comprehensive, long-term study of the planet's atmosphere, magnetic field and its moons. The Galileo could be launched from the Shuttle either in November 1989, or June 1991, or be launched by an expendable launch vehicle.

The Ulysses mission, a cooperative effort between NASA and The European Space Agency, will provide the first view of the sun and the solar system from above the ecliptic plane. The data will provide knowledge about the sun and also will help scientists to better understand the effects of solar activity on the Earth's weather and climate. The Ulysses mission is being considered for launch in September 1989 or October 1990.

Atlas (formerly Earth Observation Mission 1 and 2), planned as a 1986 launch, will be the first of a flight series to study long-term changes in solar irradiance and to monitor changes in the chemical composition of the middle and upper parts of Earth's atmosphere over an 11-year solar cycle. Atlas is manifested for November 1990.

The Hubble Space Telescope originally scheduled for launch in October 1986, will carry five scientific instruments to study the stars, planets and interstellar space. Four telescopes are provided by the United States and the fifth by the European Space Agency. During "down time," the space telescope has undergone continual "end-to-end" testing to maintain the health of the instruments. The current NASA manifest calls for launching the Hubble Space Telescope in November 1988.

Astro-1 is a Shuttle-borne observatory to explore the universe by observing and measuring the ultraviolet radiation from celestial objects. The Astro instruments can peer deeply into the ultraviolet spectrum, gaining more information than previously possible and study objects of interest to optical and radio astronomers. Astro-1 is now manifested for January 1991.

#### Earth Sciences

1986 marked a notable interest in the Earth and its environment. NASA, NOAA and the National Science Foundation supported the scientific research efforts of the National Committee for Atmospheric Research in outlining new science data detailing the dangers to the Earth's environment.

#### Life Sciences

An effort to develop a "breadboard" or a basic life support system for use in outer space aboard the Space Station or long-term space flight was highlighted by continued interface with project offices, colleges and universities.

#### Applications

Satellite Aided Search and Rescue System (SARSAT) developed by NASA and its international partners, is credited with saving the lives of more than 600 persons who were stranded or injured in remote areas around the world.



## AERONAUTICS

NASA's aeronautical research and technology efforts continued to expand U.S. capabilities in civil and military aviation, contributing significantly to U.S. world aviation leadership and to national security. These efforts covered the spectrum from fundamental disciplinary research to flight testing.

In President Reagan's State of the Union address, he said "We are going forward with research on an aerospace plane... that could shrink travel times between Washington, D.C. and Tokyo... or any other cities no matter how distant ... to less than 2 hours." At the President's request, NASA and Department of Defense initiated the joint National Aero-Space Plane (NASP) research program that will lead to an entirely new family of aerospace vehicles.

NASP is an accelerated technology development program leading to a flight research vehicle (X-30) to validate a wide range of aerospace technologies and capabilities including horizontal takeoff and landing, single-stage operation to orbital speeds and sustained hypersonic cruise within the atmosphere using airbreathing propulsion. A wide variety of future operational aerospace vehicles will be possible as a result of this technology development and validation program, ranging from civil space launch vehicles and hypersonic transports to long-range air defense interceptors.

Other joint NASA/DOD programs, such as the X-29 forward swept wing experimental aircraft, X-wing research aircraft, the tilt rotor/JVX aircraft and the mission adaptive wing, substantially augmented the military data base. Joint NASA/Federal Aviation Administration programs addressed lightning strikes, wind shear, icing and other issues affecting aviation safety.

The forward swept wing X-29 aircraft completed its flight envelope at the Ames-Dryden Flight Research Facility, Edwards, Calif., in November. The X-29 is a joint Defense Advanced Research Projects Agency/U.S. Air Force/NASA flight research program.

A modified F-15 jet aircraft performed the maiden flight of the highly integrated digital electronic control (HIDEC) system. HIDEC provides coordinating communication between the aircraft's flight control computer and engine control computer for better performance.

The world's most powerful supercomputer facility, the Numerical Aerodynamic Simulation (NAS) system located at Ames, became available to scientists and engineers throughout the United States in July. The NAS system is chartered to

progressively incorporate the world's most advanced supercomputer technology into the NAS facility and serve as a pathfinder in supercomputing for government, industry and universities.

The NAS CRAY-2 computer is unique in having a 256-million word memory (largest yet available) and can perform 250 million computations a second.

Accomplishments in the turboprop research area include successful completion of ground tests of both single- and counter-rotation propfan concepts in preparation for flight tests to verify large-scale propeller structures, aeroelastics and acoustics. The unducted fan, gearless counter-rotation propfan has attained 0.72 Mach number, exceeding all previous propeller design capability, during flight tests on a modified production aircraft under industry sponsorship.

The 1986 tilt rotor research accomplishments included the use of the XV-15 Tilt Rotor Research Aircraft to investigate rotor/wing aerodynamic interaction flow phenomena. NASA, FAA and DOD signed an agreement to study the potential national benefits of tilt rotor technology.

The fabrication and assembly of the Rotor Systems Research Aircraft/X-Wing research vehicle was completed in August. The joint DARPA/NASA program continues to advance the state of technology in high speed rotorcraft flight.

The United States (DOD/NASA) and the United Kingdom signed a joint research agreement in early 1986 to foster collaboration in the development of advanced Short Take-Off and Vertical Landing (ASTOVL) technologies aimed at reducing the technological risk associated with potential ASTOVL aircraft development.

A take-off/landing monitor was developed and successfully evaluated by more than 30 pilots. The monitor provides pilots with an integrated display of aircraft state during take-off and landing including safety warnings and indications of optional stopping positions on the runway.

NASA and FAA signed an agreement for a 5-year, \$24 million research project to develop technology for airborne wind shear detection and avoidance.

NASA-Ames Research Center, Mountain View, Calif. signed a Small Business Innovation Research contract with ACA Industries, Palos Verdes, Calif., to build the advanced concept joined wing. Initial flight tests are planned by ACA Industries for early 1988 at Mojave, Calif. The joined wing incorporates a swept-back main wing that is joined, close to its wing tips, to a swept-forward rear wing. Lighter aircraft structures and increased fuel efficiency are the primary benefits anticipated.

## SPACE TECHNOLOGY

The NASA Space Research and Technology program provides critical and sometimes unique elements of the technology base which enables national leadership in space activities. It is focused on technology for the development of more capable, less costly space transportation systems, large space systems such as growth space station, geosynchronous communication platforms and advanced scientific, Earth observation and planetary exploration.

A cryogenic bearing mechanical/thermal model is now operational and is being used to determine cooling, lubrication and bearing design characteristics supporting increased bearing life.

A hollow core, single crystal, turbine blade design has shown the potential of up to 20 times the low cycle, fatigue life of directional solidified blade materials currently in use.

Technology for space-based liquid oxygen/hydrogen expander cycle engines has progressed in the areas of combustion, heat transfer, materials compatibility, high expansion ratio nozzle performance and engine level system testing.

The technology for small chemical thrusters advanced significantly in 1986.

Progress continues in improving the performance of solar photovoltaic cells and arrays. Recent successes include reducing performance loss caused by natural radiation.

Phase II of the joint DOD/Department of Energy/NASA Space Nuclear Reactor Power System Development Program (SP-100) started in 1986. NASA supported DOE's major SP-100 ground engineering systems acquisition process which led to a multi-year contract award to the General Electric Co.

New lightweight composite materials of titanium and graphite or tungsten fibers were demonstrated to be feasible for heat pipe fabrication for use at temperatures of 1,000 degrees C.

NASA completed initial evaluations of teleoperated robotic space servicing tasks. Orbital refueling and space structural assembly tasks were evaluated.

NASA investigations of titanium doped sapphire laser materials have resulted in a 5-fold increase in power efficiency. This improvement was the result of close cooperation between NASA system modelers and materials manufacturers. The new lasers offer the potential for the important scientific objective of space sensing of atmospheric water vapor profiles.

Future and long-duration manned missions and bases will require revolutionary new concepts in environmental control and life support systems. Progress was made in developing and testing advanced components which are more reliable, lighter and more efficient in the areas of regenerable air revitalization and water reclamation.

Research has focused on the development of advanced thermal protection systems for the Space Shuttle, advanced space transportation systems and hypersonic vehicles including the Aeroassisted Orbital Transfer Vehicle and the National Aero-Space Plane. A chemical vapor deposition facility is now in operation for studies on ceramic/ceramic composite processing for the development of highly durable, high temperature hot structures.

## SPACE TRACKING AND DATA SYSTEMS

The Space Tracking and Data Systems program plans, implements and operates the worldwide tracking, data handling and communications facilities and services in support of NASA and other agency programs. Support is provided to planetary spacecraft, Earth-orbiting satellites, Shuttle missions, sounding rockets and balloons, and aeronautics research vehicles.

The launches of the next two Tracking and Data Relay Satellites (TDRS) to complete the satellite constellation of three in-orbit for an operational system were planned for 1986. The TDRS launched on Jan. 28, was lost in the Space Shuttle 51-L accident. The current Shuttle manifest includes launches of the next two TDRS satellites in 1988. Ground-based tracking network operations, which support low-Earth orbital spacecraft, are being extended to provide needed coverage until TDRSS becomes operational.

In 1986, the TDRS program initiated plans for a second ground terminal with the release of a request for proposal on competitive design studies. This ground terminal will provide a backup to the single ground terminal in the event of a major failure or planned service outages for equipment replacement.

An upgrade of the Deep Space Network (DSN) was key to the success of the Voyager 2 encounter with the planet Uranus in late January 1986. Nearly 500 images of the planet, its satellites and rings were obtained during the near-encounter phase. This support was possible due to a new method of arraying NASA's large antennas and by combining signals with Australia's large antenna at their Parkes facility. Also during March and April, the DSN completed its rather extensive support to the various Halley's Comet observations.

Work also began in 1986 to increase the sensitivity of the DSN in preparation for the Voyager 2 encounter with the planet Neptune in 1989. This will be accomplished by improving the efficiency of the large DSN antennas and by simultaneously combining signals received by the DSN antennas, during the encounter, with other antennas at non-NASA facilities.

A major development in NASA's ground communications program, the Program Support Communications Network (PSCN), became operational in 1986. The PSCN is a common user, integrated, digital network connecting NASA installations, major contractors and universities. The network provides voice and data services to support the agency's institutional and programmatic requirements. It employs advanced technologies developed by the communications industry.

## COMMERCIAL PROGRAMS

A memorandum of understanding was signed with SPACEHAB, Inc., Seattle, establishing a framework for cooperation in SPACEHAB's efforts to develop and market payload bay habitable modules that would augment the Space Shuttle crew compartment.

Twenty-five teams were selected as a result of NASA's second solicitation to establish Centers for the Commercial Development of Space. The objective of these centers is to stimulate high technology research in the microgravity of space.

An agreement with Boeing Aerospace Co., Seattle, was established to fly a series of materials processing experiments on the Shuttle. The objective of the experiments is to prove that crystals of a size and quality, impossible to create on Earth, can be produced in space.

Lawrence F. Herbolzheimer was appointed deputy assistant administrator for the Office of Commercial Programs. He is responsible for advancing the interests and participation of the private sector in the U.S. space program.

Four teams (from 25 submissions) were selected under the second program solicitation, establishing Centers for the Commercial Development of Space.

Using NASA Apollo program technology, a UNISTICK control system was developed by the Johnson Engineering Corp., Boulder, Colo., under a joint agreement with the U.S. Veterans Administration. When installed in a road vehicle, the system allows the handicapped to drive by using a joystick.

Boeing Aerospace Co., Seattle, was selected for contract negotiations to develop and implement a program to stimulate and sustain interest by U.S. companies in the utilization and application of aeronautics and space technology.

An agreement was reached with Space Services Inc. of America, Houston, for use of NASA's Wallops Flight Facility for launch of the expendable Conestoga booster.

NASA selected 172 research proposals for immediate Phase I award negotiations in the agency's 1986 Small Business Innovation Research Program. Included were 144 small, high technology firms located in 31 states and territories.

NASA and the 3M Co. signed an agreement under which the firm will conduct 62 materials processing experiments aboard the Space Shuttle over an extended period.

## INTERNATIONAL AFFAIRS

### Space Station

NASA and its Space Station partners reached agreement on hardware elements that would be carried into preliminary design, including permanently-attached laboratories (ESA and Japan), a polar platform (ESA) and a mobile servicing center (Canada). In addition, NASA and ESA jointly will study a man-tended free flyer to provide a basis for determining its utility to the Station.

U.S. negotiations began with Canada, ESA and Japan on agreements for the detailed design, development and operational Station program phases. It is anticipated that agreements will focus on programmatic and management mechanisms for program implementation and on political commitments and the legal regime within which the program will operate.

NASA, National Oceanic and Atmospheric Administration (NOAA) and their counterpart agencies in Europe, Japan and Canada, have begun planning the research and operational Earth observation payloads for the NASA and ESA Space Station polar platforms.

### IACG

Interagency Consultative Group for Halley's Comet (IACG) representatives witnessed, from control centers in the Soviet Union and the Federal Republic of Germany, the historic Halley encounters by the Soviet Vega and ESA's Giotto missions. The IACG presented the scientific results from the six spacecraft encounters with Comet Halley to the international community, the President of the Republic of Italy and Pope John Paul II. The IACG is comprised of NASA, ESA, the U.S.S.R. Intercosmos Council and Japan's Institute of Space and Astronautical Science.

### ESA Reception of ERS-1 Data

The Acting Administrator and the ESA Director General signed a memorandum of understanding that permits NASA reception of limited quantities of synthetic aperture radar data from ESA's Earth Remote Sensing Satellite-1. Under the agreement, NASA also will exchange its scatterometer and radar imagery for other ERS-1 data of interest. In permitting NASA direct readout from ERS-1, ESA reciprocates similar provisions made by NASA for European data readout from the Seasat and Nimbus-7 spacecraft.

### Launch Services

NASA and the Government of Indonesia concluded an agreement with the launch of the Palapa B2-P communications satellite on a Delta vehicle in March 1987. The Palapa system provides essential telecommunications to the Indonesian archipelago.

## Aircraft Survey of the Amazon

NASA and the Brazilian Space Institute conducted the first phase of an extensive aircraft survey over the Amazon, known as the Global Tropospheric Experiment/Amazon Boundary Layer Experiment. The program goal is to better understand the global atmospheric circulation and to contribute to long-term research objectives in climatology. The second phase is planned for the April-June 1987 rainy season over the Amazon.

## Agreements

Annex III to the Protocol on Cooperation in Aeronautical Science and Technology was signed by China and the U.S. to cover a second phase of cooperation, including a cooperative basic research program in fatigue and fracture mechanics. A joint symposium on propulsion research instrumentation was held in China.

The text of a new U.S./U.S.S.R. Space Cooperation Agreement was negotiated. The proposed agreement envisages bilateral cooperation in solar system exploration, life sciences, solar-terrestrial sciences, Earth sciences and astronomy/astrophysics.

The United States and the Kingdom of Morocco agreed on the one-time establishment of a Space Shuttle emergency landing site at Casablanca/Mohamed V Airport, in advance of Mission 51-L. The two sides also discussed development of a longer-term agreement for the use of the airfield at Ben Guerir as a Shuttle emergency landing site.

## International Tracking System Highlights

The Australian Commonwealth Science and Industrial Research Organization, Parkes Radio Astronomy Observatory provided support to the Voyager encounter with the planet Uranus under an arrangement involving the NASA Deep Space Network.

The Japanese Institute of Space and Astronautical Science's Usuda Deep Space Station participated with NASA in the first experiment to take orbiting Very Long Baseline Interferometer measurements. The same quasar radio source was observed simultaneously from space and from the two ground stations successfully for the first time.

## U.N./Committee on the Peaceful Uses of Outer Space

After a decade of negotiation, the United Nations adopted a set of non-binding principles governing remote sensing operations by member states. The principles reflect U.S. policies and practices for the conduct of remote sensing operations, specifically by encouraging international cooperation and the availability of data on a public, non-discriminatory basis.



# NASA News

National Aeronautics and  
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Washington, D.C. 20546  
AC 202-453-8400

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## For Release:

Mark Hess  
Headquarters, Washington, D.C.  
(Phone: 202/453-1167)

December 23, 1986  
4 P.M. EST

RELEASE: 86-180

## SPACE STATION ORGANIZATION APPROVED

NASA Administrator Dr. James C. Fletcher has approved the organization for the Office of Space Station at NASA Headquarters.

In addition to the associate administrator and two deputies, the approved Space Station organization includes a chief scientist, a senior engineer and six division directors responsible for Resources and Administration, Policy, Utilization, Operations, Strategic Plans and Programs and Information Systems. There is also a position of special assistant to the associate administrator.

The associate administrator for the Office of Space Station is Andrew J. Stofan, former director of the Lewis Research Center. He was named to that position in June 1986. Franklin D. Martin is the deputy associate administrator for Space Station. Previously director of Space and Earth Sciences at the Goddard Space Flight Center, Martin was named to this post in September 1986.

Thomas L. Moser is the deputy associate administrator for development, a new position established by the reorganization. In this position, Moser also will serve as the program director for Space Station, directing the Washington-area office that will be responsible for overall technical direction and content of the Space Station program, including systems engineering and analysis, program planning and control, configuration management and the integration of all the elements into an operating system. Creation of the program director position was the central element of program restructuring in response to recommendations of the committee headed by former Apollo Program Director Gen. Samuel Phillips which conducted an extensive examination of the Space Station organization. Moser was named to this position in October 1986.

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A major portion of the systems integration will be performed at the NASA centers through Space Station field offices to be established at the Goddard Space Flight Center, Greenbelt, Md.; Johnson Space Center, Houston; Kennedy Space Center, Fla.; Lewis Research Center, Cleveland; and Marshall Space Flight Center, Huntsville, Ala. The Space Station project manager at each of the five centers will head the field office and will report directly to the program manager in Washington. The program office and field offices will be assisted in systems engineering, analysis and integration activities by a program support contractor who will be competitively selected next year. The organizational structure for the program office in Washington has not been developed, and the field office managers at the centers have not been named.

Daniel H. Herman has been named senior engineer, a new staff position created under the Space Station reorganization. The senior engineer will advise the associate administrator on the policy, schedule, cost and user implications of technical decisions. Previously, Herman was director of the engineering division whose functions and responsibilities have been absorbed by Moser's organization and was on the original Space Station Task Force which defined the basic architecture of the current Space Station system.

David C. Black will continue to serve as chief scientist for the Space Station until his appointment expires. Black, chief scientist of the Space Research Directorate at the Ames Research Center, Mountain View, Calif., has served as chief scientist for the Space Station since the post was created in 1984.

Paul G. Anderson will act as the director of the Resources and Administration Division, which is the combination of the former Business Management and Program Support organizations. Anderson previously served as comptroller at the Lewis Research Center.

Margaret Finarelli is director of the Policy Division which has functional responsibility of the former Policy and Plans organization. This element of the reorganization reflects the strong policy coordination role required of the Space Station office in working with other elements of NASA, the international partners and other external organizations. Prior to this assignment, Finarelli was chief, International Planning and Programs Office in the International Affairs Division, NASA Headquarters.

Richard E. Halpern is the director of the Utilization Division which has responsibility for developing user requirements for the Space Station, including science and applications, technology development and commercial users, and ensuring that those requirements can be efficiently and economically accommodated on the Space Station. Halpern was the director of the Microgravity Science and Applications Division in the Office of Space Science and Applications prior to accepting this position.

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The Operations Division has the responsibility for developing an overall philosophy and management approach for Space Station system operations, including user support, prelaunch and postlanding activities, logistics support and financial management. Granville Paules is currently serving as acting director of the Operations Division.

Under the new organization, two new divisions, Strategic Plans and Programs and Information Systems, were formed. Alphonso V. Diaz has assumed the position of director of Strategic Plans and Programs and has responsibility for ensuring that the evolution of the Space Station infrastructure is well planned and coordinated with other NASA offices and external elements. As part of its responsibility, this division will manage and act as the single focus for Space Station automation and robotics activities and program-focused technology and advanced development work. Diaz has been at NASA Headquarters since 1979 and most recently served as deputy director of the Solar System Exploration Division within the Office of Space Science and Applications.

The Information Systems Division will provide a management focus for the total end-to-end information system complex for Space Station. A director for that division has not been named.

William P. Raney, who had served as director of the Utilization and Performance Requirements Division, is currently serving as special assistant to the associate administrator.

The Space Station, consisting of a manned base and unmanned free-flying platforms, will be a permanent research facility in low earth orbit for the conduct of science, technology and commercial activities in space. Operations aboard the Space Station are planned to begin in the mid 1990s.

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# NASA News

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Mark Hess  
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RELEASE: 86-181

## SPACE STATION ANALYSIS RESULTS

NASA Administrator Dr. James C. Fletcher today accepted the additional analysis conducted by the Office of Space Station and directed Andrew J. Stofan, associate administrator for the Space Station to implement the recommended technical and work package modifications to the Space Station configuration that resulted from the review conducted this past summer.

The additional analysis was in the areas of Space Station management, use of expendable launch vehicles (ELV), and cost impacts resulting from design changes.

In September, Fletcher directed the Space Station office to provide additional detail in the three areas as a prerequisite to approving recommendations following a review of the Space Station program.

A detailed engineering review of the Space Station configuration was performed by the Critical Evaluation Task Force (CETF). The task force examined the Space Station baseline configuration, specifically with respect to issues of transportation capability, flight assembly and checkout, operations and safety.

An Executive Technical Committee, headed by Stofan, provided technical oversight to the task force and performed the review of the Space Station work package alignment.

Design changes recommended by the CETF included replacing the nodes and tunnels in the original Space Station design with larger "resource" nodes. The nodes are used to connect the pressurized modules.

The expanded nodes will house racks of command and control equipment, which in the baseline configuration had been located outside on the framework of the Station, thereby reducing significantly the amount of extravehicular activity required to maintain and replace equipment over the lifetime of the facility.

The CETF also recommended revising the assembly sequence to provide early scientific return and reduce extravehicular activity on early Station assembly flights. The design also incorporates an initial power level of 37.5 kilowatts of power, achieves a permanent manned capability with fewer Shuttle flights, places the fixed servicing capabilities closer to the modules, and makes room for early payloads. The design also reduces EVA requirements for assembly and maintenance of the Space Station, and features an improved safe haven capability.

The oversight committee recommended a realignment of certain work package responsibilities. Under that realignment, the Marshall Space Flight Center responsibilities included the laboratory, habitation and logistics modules, engine elements of the Space Station's propulsion system and the resource node structure. The Johnson Space Center responsibilities included the external truss, distributed subsystems, EVA systems, manned space systems, components and hardware in the habitat module, airlock and resource node outfitting. The Goddard Space Flight Center's responsibilities included the Space Station platforms, attached payload accommodations, robotic servicer and NASA's role in servicing. And the Lewis Research Center's responsibilities included the power system. Contractual arrangements for the development phase between the Johnson Space Center and the Marshall Space Flight Center were to be reflected in specific exhibits in the contracts for each center's work package and were further documented in memoranda of understanding signed by both center directors.

The additional analysis requested by Fletcher focused on the functional and organizational dimension of the Space Station headquarters structure within the overall management of the program, the potential for using expendable launch vehicles, particularly with regard to Space Station launch and assembly, and the cost impacts of the task force recommended design modifications to the baseline configuration. A summary of the results follows:

## MANAGEMENT

A detailed analysis of the management of the Space Station program, with emphasis on system engineering and integration, was conducted by a study team headed by Larry Ross, director, Space Flight Systems at the Lewis Research Center.

In June 1986, Fletcher announced that a Space Station program office would be established in the Washington, D.C., area, which would be responsible for overall technical direction and content of the Space Station program, including systems engineering and analysis, configuration management and the integration of all the elements into an operating system.

Ross' group examined the relationship between the program office in Washington, and the project offices at the NASA field centers. The resulting recommendation was consistent with NASA's earlier decision to establish a program office in the Washington, D.C., area. A major portion of the systems integration is to be performed at the NASA Centers through Space Station field offices which will be established at Goddard Space Flight Center, Greenbelt, Md.; Johnson Space Flight Center, Houston; Kennedy Space Center, Fla.; Lewis Research Center, Cleveland; and Marshall Space Flight Center, Huntsville, Ala. The Space Station project manager at each of the five centers will head the field office and will report directly to the program director in Washington.

The study team concluded that this approach provided the most effective means to achieve the required level of program control and program accountability, coupled with an ability to utilize effectively the expertise that resides at the field centers.

## EXPENDABLE LAUNCH VEHICLES

The potential use of existing or near-operational ELVs in the Space Station program was examined by a team headed by John Dunning of the Space Station Project Office at the Lewis Research Center.

The teams' analysis demonstrated that, under certain conditions, the schedule for achieving both the man-tended and permanently manned milestones in the assembly sequence could be accelerated by 4 to 9 months through the use of ELVs. However, ELVs would increase the amount of EVA required during the first four Station-dedicated Shuttle assembly flights by 10 to 40 percent, would require basing an Orbital Maneuvering Vehicle at the Station throughout the assembly phase to control, boost, and reboost passive structural elements, and could impact the weight and design of Space Station components because of the higher dynamic forces associated with ELVs.

The analysis also demonstrated that the accelerated assembly schedule was dependent upon retaining the current Shuttle flight rate to support assembly of the Station, and required the availability of as many as three Titan 4 launches during the first 2 years of Station assembly activity.

This analysis led the Space Station office to conclude that the substantial technical and programmatic uncertainties, the increased operational risks associated with the use of ELVs for the initial assembly phase and the increase in costs required to compensate for these uncertainties and risk far outweighed the marginal schedule benefits to the Space Station program and it recommended the Space Shuttle be retained as the baseline transportation system for assembling the Station's manned base.

However, the program will continue to retain the option of using an expendable launch vehicle to launch the polar platform, one of two unmanned free-flyers that are components of the Space Station program. The study group concluded an ELV could be used to launch the high inclination platform in the event of a delayed reactivation of the Shuttle launch site at Vandenberg Air Force Base.

Also, recognizing that ELV's can be used for Space Station, and that the agency is continuing to reevaluate its STS utilization strategy in the context of overall national needs, Stofan has directed the program office to participate in the agency's mixed fleet studies and be prepared to discuss possible alternative strategies to the baseline for both assembly, maintenance and resupply of the Space Station.

#### COST IMPACT

The final item that was examined was the cost impact of the configuration changes recommended by the CETF. The analysis shows a net increase of approximately \$49 million due primarily to replacing the nodes and tunnels, as defined in the original baseline configuration, with larger "resource" nodes and to increasing the power level of the photovoltaic solar arrays from 25 to 37.5 kilowatts. In addition, two cupolas were added to the configuration as was some support structure for the reaction control system.

A separate major review of Space Station cost estimates is currently underway. This review, which began in September, is being conducted by a team of approximately 35 technical and resource experts from the Space Station office and the NASA Comptroller's office. Results of this review will be presented to the NASA Administrator in mid-January.

Based upon these analyses, Fletcher has directed the Space Station Program to implement the technical and work package modifications to the Space Station configuration as outlined in the recommendations of the earlier review. The Administrator has also approved the memoranda of understanding between the Johnson Space Center and the Marshall Space Flight Center concerning work package responsibilities.

Completion of the analysis clears the way for final preparation of the requests for proposals (RFPs) for detailed design and development of the Space Station which are scheduled to be released to industry in February 1987.

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December 31, 1986

Terry White  
Johnson Space Center, Houston, Texas  
(Phone: 713/483-5111)

RELEASE: 86-183

## ASTRONAUT WEITZ NAMED JOHNSON SPACE CENTER DEPUTY DIRECTOR

Veteran astronaut Paul J. Weitz, 54, today was named deputy director of NASA's Johnson Space Center in Houston. Weitz had been assigned as technical assistant to JSC Director Aaron Cohen, since October 1986.

Weitz was part of the crew on the first manned visit to the Skylab in 1973 and was commander of the sixth Space Shuttle mission in April 1983 during which the first Tracking and Data Relay Satellite was launched.

He was selected as an astronaut in April 1966. Weitz retired from the U.S. Navy in June 1976 and entered federal government service as a NASA civilian employee.

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December 31, 1986

Diana Boles  
Kennedy Space Center, Fla.  
(Phone: 305/867-2468)

RELEASE: 86-184

NASA AWARDS CONTRACT EXTENSION TO EG&G FLORIDA, INC.

NASA's John F. Kennedy Space Center, Fla., has awarded EG&G Florida, Inc., Cocoa, Fla., a 1-year, \$129.3 million extension to its existing contract for base operations services.

The extension covers the period of Jan. 1 through Dec. 31, 1987, and brings the total value of the contract to \$565.3 million. This is the fifth 1-year extension to the Base Operations Contract awarded EG&G in January 1983.

EG&G Florida, Inc. is part of the Government Services Division of EG&G, Inc., based in Wellesley, Mass.

Under the extension, EG&G will continue to provide institutional and technical support services such as utilities, facilities, administrative services, technical operations and health and protective services at the Kennedy Space Center.

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December 31, 1986

Terry M. Eddleman  
Marshall Space Flight Center, Huntsville, Ala.  
(Phone: 205/544-0034)

RELEASE: 86-185

## NASA SELECTS CONTRACTOR TO OPERATE COMPUTER COMPLEX

NASA's Marshall Space Flight Center, Huntsville, Ala., has selected Computer Sciences Corp./Pan Am World Services, Falls Church, Va. for negotiations leading to award of a 10-year contract to operate a space agency computer facility.

The contract will call for the management, operation, maintenance and protection of Marshall's Slidell Computer Complex, Slidell, La. The facility provides computer services support primarily to Marshall's Michoud Assembly Facility, New Orleans, which manufactures external tanks for the Space Shuttle.

The company will provide the necessary personnel, equipment and supplies to carry out its duties. The contract has an initial period of performance of 1 year, beginning in February 1987, and will contain nine 1-year options. The approximate, proposed value of the 10-year contract will be \$99 million.

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